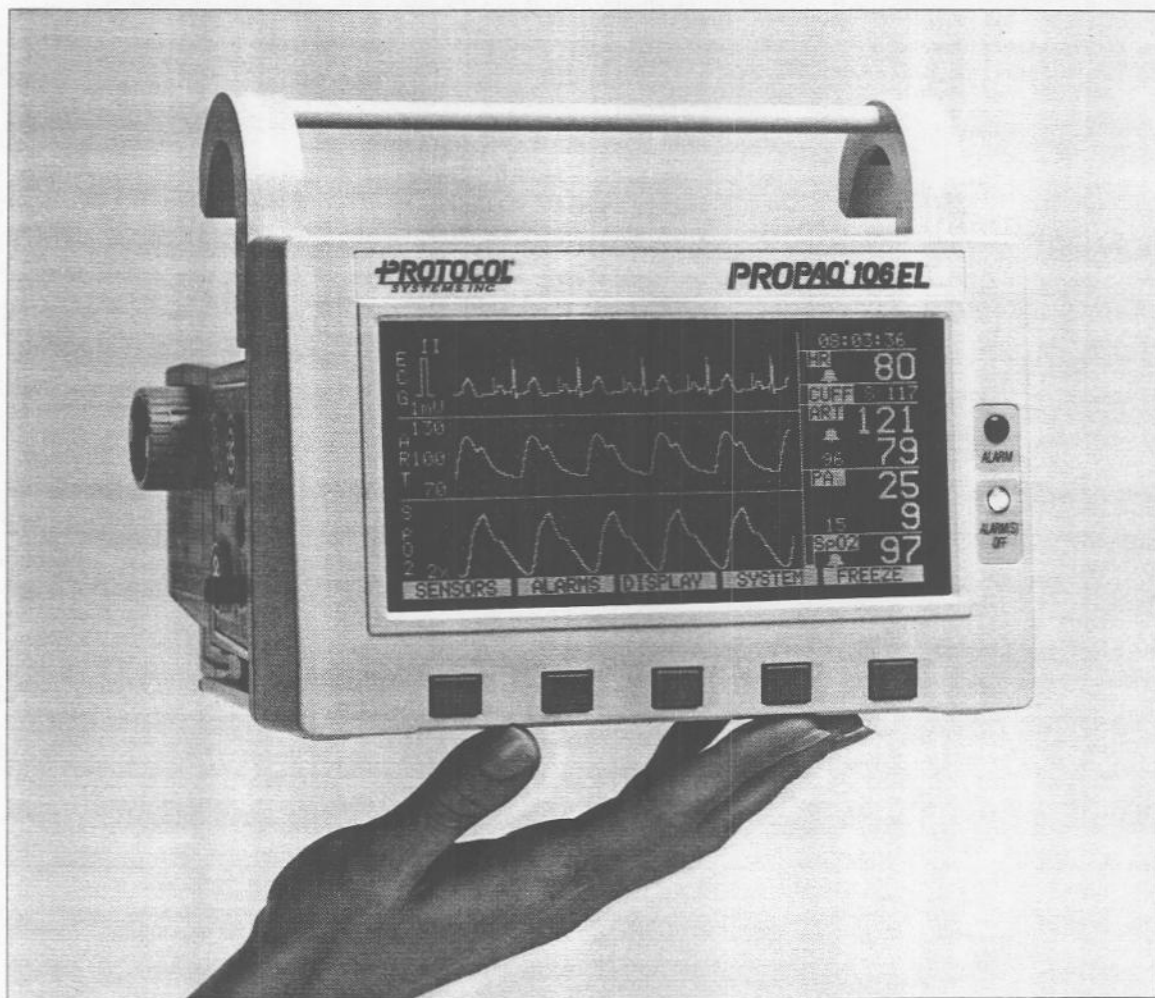


PROPAQ[®]

Service Manual



PROTOCOL[®]
SYSTEMS, INC.

PROPAQ®
100-Series* Monitors
Schematics & Drawings Set
M-Series Hardware, Software Versions 7/8

****IMPORTANT SERIAL NUMBER INFORMATION***

This manual (810-0334-XX) applies only to 100-Series Monitors with serial numbers beginning with an "M" (such as ME00204, or MB00223), and to printers with serial numbers beginning with MCO. If your printer's serial number begins with TCO, and your monitor's serial number begins with TB, use Service Manual 810-0012-XX; if your monitor's serial number begins with TE, use Service Manual 810-0257-XX.

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GSA Listing # V797P-3165J

NSN Listings:

Model 102/LCD: 6515-01-3156196
Model 104/LCD: 6515-01-3156198
Model 106/LCD: 6515-01-3156197
Model 102/EL: 6515-01-3627449
Model 104/EL: 6515-01-3627451
Model 106/EL: 6515-01-3627447
Expansion Module with Printer: 6515-01-3159814
Oximeter (SpO2): 6515-01-3631219

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Safety Summary

The general safety information in this summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the Operator's Guide and other manuals where they apply. Such specific warnings and cautions may not appear here in this summary.

CAUTION

CAUTION statements in the documentation identify conditions or practices that could result in damage to the equipment or other property.

WARNING

WARNING statements in the documentation identify conditions or practices that could result in personal injury.

Symbols

The following symbols may appear in the documentation, and on labels on the Propaq monitors.



DANGER: Risk of explosion when used in the presence of flammable anesthetics. (This is on older versions only.)



Type CF, Isolated patient connections comply with the allowable risk (leakage) current limits for direct cardiac application and are protected against the effects of defibrillation.



Type BF, Isolated accessible and applied parts comply with the allowable risk (leakage) current limits for noncardiac body applications, protecting the patient and operator from risk of electric shock.



Protected against water dripping vertically. (Protection Classification IPX1 per IEC Publication 529.)



DC power input connector for applications not requiring a "high output" power adapter.



DC power input connector for applications requiring a "high output" power adapter.



For continued fire protection, use only the specified fuse.



Internal power transformer meets requirements of a short-circuit-proof safety-isolating power transformer (symbol is located on ac power adapter).



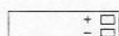
Caution: Refer to User's Guide and accompanying documentation.



Caution: Refer servicing to qualified service personnel. (For products certified by Underwriters Laboratories.)




Battery.



Positioning of battery.

--- Direct current.

~ Alternating current.

 For indoor use only.

Important Safety Considerations

Place the product in a location where it cannot harm the patient should it fall from a shelf or other mount.

Do not autoclave this product.

Inspect the power adapter cord periodically for fraying or other damage, and replace the adapter as needed. (The power adapter is not a serviceable part; however, the detachable power cord used with the Universal Power Adapter is replaceable). Do not operate the apparatus from mains power with a damaged power adapter cord or plug.

Frequent electrical and visual checks should be made on cables and electrode wires. Broken or frayed electrode wires, or loose snap-fittings may cause interference or loss of signal. Particular attention should be paid to the point at which the wire enters the snap-fittings, since flexure will eventually cause breakage of strands at this point.

Avoid electrosurgery burns at monitoring sites by ensuring proper connection of the electrosurgery return circuit. If the electrosurgery return electrode is improperly connected, the other patient-connected monitoring electrodes and transducers (particularly ECG electrodes and temperature probes) will serve as return paths for the high-frequency energy. This is especially true for older electrosurgery units which have the return circuit deliberately earth-grounded. For improved safety, never deliberately ground the return circuit of an isolated-output electrosurgery unit. If necessary, operate the monitor on battery power only to prevent a return to earth ground through the monitor.

To assure operator safety during defibrillation, keep the discharge paddles away from ECG and other electrodes, as well as other conductive parts in contact with the patient. During defibrillation, always avoid contact with any accessories, such as cables and sensors, connected to the Propaq's left side panel. For additional safety precautions, refer to the defibrillator operator's manual.

To ensure patient safety, the conductive parts of the ECG electrodes (including associated connectors) and other patient-applied parts should not contact other conductive parts, including earth ground, at any time.

Do not operate this product in the presence of flammable anesthetics. Explosion can result. This product must only be operated in strict conformance with local fire prevention regulations.

NOTE

Within certain governmental jurisdictions, all interconnected accessory equipment must be labeled by an approved testing laboratory. After interconnection with accessory equipment, risk (leakage) current and grounding requirements must be maintained.

To ensure patient safety, use only accessories recommended or supplied by Protocol Systems, Inc. For a list of those accessories, see the Protocol Products and Accessories book (PN 810-0409-00) that accompanies the Users Guide.

Do not autoclave accessories unless the manufacturer's instructions clearly approve it. Many accessories can be severely damaged by autoclaving.

To ensure conformance to risk (leakage) current requirements when operating from an ac mains power source, use only a Protocol Systems' 503-0002, 503-0053, or 503-0054 power adapter.

Pour limiter le courant de fuite conformément aux exigences lorsque l'appareil est branché au secteur, utiliser seulement un bloc d'alimentation de la série 503-0002 503-0053, 503-0054.

A product that has been dropped or severely abused should be checked by qualified service personnel to verify proper operation and acceptable risk (leakage) current values.

While under warranty, the Propaq should be serviced only by Protocol Systems' service personnel. Service documentation is available from Protocol Systems, Inc. to aid the biomedical engineer during post-warranty period service.

Component replacement and internal adjustments must be made by qualified service personnel only.

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General Information

Available Documentation

There are two manuals for servicing the Propaq 100-Series Monitors: The *Calibration/Maintenance Manual*, and the *Schematics & Drawings Set*, which includes the appropriate option section for SpO₂, CO₂ and Propaq Printer options. See ordering information below.

The *Calibration/Maintenance Manual* contains information for the service technician to service Propaq monitors at the **replaceable module level**. Replaceable modules are items that can be easily replaced without desoldering circuit board components.

Servicing to the **component level** requires the *Schematics & Drawings Set*, and the appropriate option section for SpO₂, CO₂ and Propaq Printer options.

- Detailed circuit descriptions, bills of materials, mechanical assembly drawings, and schematics of the monitor main board, interconnect board, and recharger board are found in this *Schematics & Drawings Set*.
- Similar information on the Printer, Oximeter, and Capnograph is found in the appropriate option section of the *Schematics & Drawings Set*.
- For cabling diagrams and block diagrams, refer to Section 7 of the *Calibration/Maintenance Manual*.

Service manuals contain service information for the biomedical electronic technician (BMET or CBET). Only factory-trained technicians should service the Propaq series monitors.

NOTE

This manual does not include operating instructions or information. Refer to the appropriate user's guide.

About This Manual

The *Schematics & Drawings Set* contains two sections, briefly described below:

- **Section 1 General Information**—This section contains information about how to use the manuals, and a description of the Propaq series monitors, optional Expansion Module with printer, SpO₂ option, and CO₂ option.
- **Section 2 Diagrams**—This section contains detailed circuit operation descriptions, bills of materials, mechanical assembly drawings, and schematics for each of the monitor's circuit boards and specific options.

Product Description

The Propaq series is a product line of lightweight, ultra-portable patient monitors applicable to a wide variety of health care services. These monitors measure and display a patient's vital signs, including ECG, non-invasive blood pressure, invasive blood pressure, temperature, oxygen saturation derived by pulse oximetry (with SpO₂ Option) and mainstream carbon-dioxide monitoring (with CO₂ Option). Propaq configurations vary depending on the model. Table 1-1 lists the monitors and their configurations available at the printing of this manual.

Table 1-1. Propaq 100-Series Monitors Configurations

Model	Standard Features							Options			
	ECG	Cuff	P1	P2	T1	T2	Analog Out/ Defib Sync	SpO ₂	CO ₂	Printer	HP Conn.
102	♥	♥			♥	♥	♥	♥	♥	♥	♥
104	♥	♥	♥		♥	♥	♥	♥	♥	♥	♥
106	♥	♥	♥	♥	♥		♥	♥	♥	♥	♥

All models of monitor may be ordered with the optional Hewlett-Packard patient connector side panel.

The Propaq Expansion Module allows SpO₂ and CO₂ monitoring to be added to any Propaq monitor. The Expansion Module with Printer (EMP) includes a high-resolution, dot-matrix printer for documenting patient vital signs.

Limited Warranty

The Propaq 100-Series Monitors are sold by Protocol Systems, Inc. under the warranties set forth in the warranty statement supplied with each product. Additional copies of the warranty statement can be obtained from Protocol Systems, Inc.

History of Manuals By Monitor Serial Numbers

Propaq manuals are updated with each new monitor design, and history information is provided (as deemed appropriate) for earlier monitors. In some cases, an early manual is re-released with an updated part number; in other cases, a new manual is released. The following table lists the releases of Propaq manuals, and cross-references the serial numbers of the monitor and printer (and the software version number) to which the manual applies.

Monitor/Printer Serial Number & Software Version	Issue/ Revision/ Part Number	Issue Date	Comments
SERVICE DOCUMENTATION			
TBXXXXX (Printer TCOxxx) Software V.6	Rev A 810-0012-01		Technical Reference Guide
TEXXXXX (Printer TCOxxx) Software V.6	Rev A 810-0257-00	2/92	Technical Reference Guide
MXXXXXX (Printer MCOxxx) Software V.7	Rev A 810-0334-00	10/92	Service Manual Version 7 software
MXXXXXX (Printer MCOxxx) Software V.7/8	Rev A 810-0334-01	9/93	Calibration/Maintenance Manual, adds Capnograph and Version 8 software
MXXXXXX (Printer MCOxxx) Software V.7/8	Rev A 810-0334-10	9/93	Schematics & Drawings Set
MXXXXXX (Printer MCOxxx) Software V.7/8	Rev A 810-0334-30	9/93	Printer Section of 810-0334-01
MXXXXXX (Printer MCOxxx) Software V.7/8	Rev A 810-0334-20	9/93	SpO ₂ Section of 810-0334-01
MXXXXXX (Printer MCOxxx) Software V.7/8	Rev A 810-0334-40	9/93	CO ₂ section of 810-0334-01
USERS DOCUMENTATION			
TXXX (Version 3.x)	Rev A 810-0035-00	4/89	Original Release (Users Guide)
TXXX (Printer TCOxxx)	Rev A 810-0085-00	8/89	Original Release (Printer Operators Guide)
TXXX (Version 4.x)	Revs A,B,C 810-0035-01	10/89, 12/89, 4/90	Updates for software 4.xx.xxx, misc. correction and update data, and international certification
TXXX (Version 5.x)	Rev A 810-0140-00	9/90	Updates for software 5.xx.xxx, adding SpO ₂

Monitor/Printer Serial Number & Software Version	Issue/ Revision/ Part Number	Issue Date	Comments
TXXX (Version 6.x)	Rev A 810-0035-02	6/91	Updates for software 6.0, includes printer operator's guide, and SpO ₂ . Adds EL option.
TXXXX (Version 6.x)	Rev A 810-0203-00	8/91	Hewlett-Packard Connector update, supplements 810-0035-02
TXXXX (Version 6.x)	Rev A 810-0250-00	10/91	Pulse oximetry update, supplements 810-0035-02
TXXXX (Version 6.2)	Rev B 810-0324-00	6/92	Software 6.2 update, supplements 810-0035-02
MXXXX (Version 7.x)	Rev B 810-0331-00	6/92	Software 7.0 update, supplements 810-0035-02
MXXXXXX (Printer MCOxxx) (Version 8.0)	Rev A 810-0408-00	4/93	Software version 8.0. Original release of User's Guide. English language

Section 2

Diagrams

This *Schematics & Drawings Set* and the separately orderable *Options Sections* contain assembly drawings, detailed circuit descriptions, bills of materials, and electrical schematics for the Propaq 100-Series monitors, Printer, SpO₂, and CO₂ options.

Tabbed pages separate the major assemblies/modules, as follows.

- 2A—Mechanical Assembly Drawings
- 2B—Monitor Main Board and Interconnect Board
- 2C—Recharger Board (LCD and EL)
- 2D—Printer—order separately as 810-0334-30
- 2E—Oximeter (SpO₂)—order separately as 810-0334-20
- 2F—Capnograph (CO₂)—order separately as 810-0334-40

For cabling, power distribution, and block diagrams, see Section 7 of the *Calibration/Maintenance Manual*. For a list of replaceable kits and parts related to these diagrams, see Section 8, *Replaceable Parts*, in the *Calibration/Maintenance Manual*. The following table lists assembly drawings and schematics as they are ordered in this section.

List Of Assembly Drawings & Schematics		
Title	Drwg #	# Sheets
Section 2A—Mechanical Assembly Drawings		
Expansion Module/Monitor, Assembly Drawing	824-0070-01	1
LCD Monitor, Assembly Drawing	824-0231-00	1
EL Monitor, Assembly Drawing	824-0232-00	1
EL Front Panel, Assembly Drawing	824-0226-00	2
LCD Front Panel, Assembly Drawing	824-0227-00	3
Rear Chassis, Assembly Drawing	824-0230-00	5
Assembly Drawing, EM w/Oximeter, Printer & CO ₂ Options	824-0208-00	9

List Of Assembly Drawings & Schematics		
Title	Drwg #	# Sheets
Section 2B—Monitor Main Board & Interconnect Board		
Main Boards		
Main Board Locator	Pages 2B-64-82	19
PCB 1st Level (First & Second Designs—EL Only)	824-0197-00	2
PCB 1st Level (Third Design—EL & LCD)	824-0242-00	3
PCB 2nd Level (First & Second Designs—EL Only)	824-0211-00	4
PCB 2nd Level (Third Design—EL)	824-0211-01	4
PCB 2nd Level (Third Design—LCD)	824-0218-00	4
Third Design Schematics (EL & LCD)	800-0023-01	12
First Design Schematics (EL Only)	800-0023-00	4**
Second Design Schematics (EL Only)	800-0023-02	1*
Interconnect Board		
PCB	824-0228-00	1
Schematic	800-0015-00	1
Section 2C—Recharger Board (LCD & EL)		
Recharger Boards		
(EL) PCB 1st Level (First Design)	824-0246-00	1
(EL) PCB 1st Level (Second Design)	824-0246-01	2
(EL) PCB 1st Level (Third Design)	824-0261-00	1
(LCD) PCB 1st Level (First Design)	824-0247-00	1
(LCD) PCB 1st Level (Second Design)	824-0247-01	2
(LCD) PCB 1st Level (Third Design)	824-0260-00	1
Ref.Dwg, M/L, EL & PCB, HW & SW Comp Matrix	825-0030-00	1
(EL & LCD) PCB 2nd Level	824-0243-01	1
(LCD) Schematics (First and Second Designs)	800-0033-00	4
(EL) Schematics (First and Second Designs)	800-0034-00	4
(LCD) Schematics (Third Design)	800-0039-00	4
(EL) Schematics (Third Design)	800-0038-00	4

*only sheet 2 differs from 800-0023-01

**only sheets 1, 2, 3, & 7 differ from 800-0023-01

List Of Assembly Drawings & Schematics		
Title	Drwg #	# Sheets
SUBSECTIONS 2D THRU 2F ARE SEPARATELY ORDERABLE		
Section 2D—Printer		
Printer Board		
Assembly, Printer PCB	824-0203-00	1
Schematic	800-0024-00	6
Paq10 Keyboard Schematic	800-0006-00	1
Section 2E—Oximeter (SpO ₂)		
SCP Board		
PCB	824-0108-01	2
Schematic	800-0008-00	4
Minisoom Assembly (Nellcor Drawing Numbers)		
PCB	079590	1
Schematics	800-0014-00	7
SpO₂ for Propaq, Assembly Drawing	824-0204-00	2
Section 2F—Capnograph (CO ₂)		
CO ₂ PCB Assembly Drawing	824-0223-00	2
CO ₂ Schematic	800-0032-00	11*
CO ₂ Mechanical Assembly (see 824-0208-00, sheets 4, 6 and 7, in Section 2A)		

*Sheets 2 through 12 only

Location of Assembly Drawing Bills of Materials, by Reference Designator

Reference Designator/Assembly Drawing	Description	Page No.
AF / 824-0070-XX	Expansion Module/Monitor Assembly Drawing	2A-1
CW / 824-0204-00	SpO ₂ Assembly Drawing	2E-11
CX / 824-0208-00	Expansion Module Assembly Drawing	2A-2
DI / 824-0226-00	EL Front Panel Assembly Drawing	2A-6
DJ / 824-0227-00	LCD Front Panel Assembly Drawing	2A-7
DM / 824-0230-00	Rear Chassis Assembly Drawing	2A-8
DN / 824-0231-00	LCD Monitor Assembly Drawing	2A-10
DO / 824-0232-00	EL Monitor Assembly Drawing	2A-10

Location of Circuit Board Bills of Materials
by Board Name/Board Number/Drawing Designator & Number

Board Name	Board Number*	Description	Dwg. Des.	Drawing Number	Page No.
Main	031-0018-00	1st Level Assembly, EL Main Board (First Design)	CJ	824-0197-00	2B-14
	032-0007-00	2nd Level Assembly, EL Main Board (First Design)	CY	824-0211-00	2B-29
	031-0018-01	1st Level Assembly, EL Main Board (Second Design)	CJ	824-0197-00	2B-30
	032-0007-02	2nd Level Assembly, EL Main Board (Second Design)	CY	824-0211-00	2B-45
	031-0040-00	1st Level Assembly, EL/LCD Main Board (Third Design)	DY	824-0242-00	2B-46
	032-0006-00	2nd Level Assembly, LCD Main Board (Third Design)	DA	824-0218-00	2B-61
	032-0007-01	2nd Level Assembly, EL Main Board (Third Design)	EF	824-0211-01	2B-61
Inter-connect	031-0016-50	1st Level Assembly, EL Interconnect Board	DK	824-0228-00	2B-62
Re-charger	031-0042-00	1st Level Assembly, EL Recharger Board (First Design)	EC	824-0246-00	2C-9
	031-0042-01	1st Level Assembly, EL Recharger Board (Second Design)	EQ	824-0246-01	2C-20
	031-0043-00	1st Level Assembly, LCD Recharger Board (First Design)	ED	824-0247-00	2C-15
	031-0043-01	1st Level Assembly, LCD Recharger Board (Second Design)	EP	824-0247-01	2C-26
	031-0046-00	1st Level Assembly, EL Recharger Board (Third Design)	EU	824-0261-00	2C-31
	031-0047-00	1st Level Assembly, LCD Recharger Board (Third Design)	EV	824-0260-00	2C-37
	032-0008-00	2nd Level Assembly, LCD Recharger Board (All Designs)	DZ	824-0243-00	2C-8
	032-0009-00	2nd Level Assembly, EL Recharger Board (All Designs)	DZ	824-0243-00	2C-8
Printer	031-0025-00	1st Level Assembly, Printer Board	CS	824-0203-00	2D-4
SCP (Oximeter)	031-0010-02	1st Level Assembly, SCP (SpO ₂) Board	CE	824-0108-01	2E-8
CO ₂ (Capnograph)	031-0029-00	1st Level Assembly, CO ₂ Board	DE	824-0223-00	2F-16

*First level circuit board assembly numbers are printed on board.

2A—Mechanical Assemblies

Bills of Materials

Reference Designator	Part Number	Description
AF Drawing Designator (Dwg. #824-0070-01), Expansion Module/Monitor		
1	640-0063-00	LABEL,FRONT,ENGLISH,EMP
1	640-0063-01	LABEL,FRONT RECORDER PANEL,GRAY,ENGLISH
1	640-0103-00	LABEL,FRONT,FRENCH EMP
1	640-0170-00	LABEL,EMP FRONT PANEL,EL MONITOR
1	640-0178-00	LABEL,EMP FRONT PANEL,EL MONITOR,FRENCH
2	640-0065-00	LABEL,DOOR,ENGLISH,EMP
2	640-0102-00	LABEL,DOOR,FRENCH EMP
3	640-0066-01	LABEL,EMP REAR PANEL,M/L,EN,FR,SP,JA
3	640-0119-01	LABEL,SP02 REAR PANEL,M/L,EN,FR,SP
3	640-0176-00	LABEL,SP02,REAR PANEL,JAPANESE
4	640-0069-00	LABEL,SAFETY AGENCY
5	640-0011-00	LABEL, PRODUCT SERIAL NUMBER WITH CSA
5	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
17	640-0114-03	LABEL,SP02 CONNECTOR,GRAY,ENGLISH
17	640-0148-02	LABEL,SP02 CONNECTOR,GRAY,FRENCH
17	640-0148-03	LABEL,SPO2 CONNECTOR PANEL,FRENCH
17	640-0177-01	LABEL,SPO2 CONNECTOR PANEL,JAPANESE,GRAY
86	501-0008-00	BATTERY,ASSY,FUSED DOUBLE
88	600-0171-01	BUMPER,.30X.50X.093 HIGH,WHITE
89	620-0115-00	SCREW,6-32X2.75"L,PHL,PHD,SS
90	620-0092-00	WASHER,#6,SPLT LK,SS
90	620-0093-00	WASHER,#6 FLAT,SS,.150X.375X.033
102	620-0093-00	WASHER,#6 FLAT,SS,.150X.375X.033
104	650-0007-00	TAPE,BLACK,.750" WIDE
105	650-0006-00	TAPE,WHITE,PLASTIC,3/4" WIDE
107	501-0008-00	BATTERY,ASSY,FUSED DOUBLE
	824-0070-01	ASSY DWG,EXPANSION MODULE/MONITOR

Reference Designator	Part Number	Description
CX Drawing Designator (Dwg. #824-0208-00), Expansion Module		
1	640-0063-01	LABEL,FRONT RECORDER PANEL,GRAY,ENGLISH
1	640-0103-01	LABEL,RECORDER PANEL,FRENCH,EMP,LCD,GRAY
1	640-0170-00	LABEL,EMP FRONT PANEL,EL MONITOR
1	640-0178-00	LABEL,EMP FRONT PANEL,EL MONITOR,FRENCH
1	640-0198-00	LABEL,EMP FRONT PANEL,EL,GERMAN
1	640-0199-00	LABEL,EMP FRONT PANEL,LCD,GERMAN
1	640-0226-00	LABEL,EMP FRONT PANEL,EL,SPANISH
1	640-0227-00	LABEL,EMP FRONT PANEL,LCD,SPANISH
1	640-0266-00	LABEL,EMP FRONT PANEL,EL,BLANK'
1	640-0267-00	LABEL,EMP FRONT PANEL,LCD BLANK
2	640-0065-00	LABEL,DOOR,ENGLISH,EMP
2	640-0102-00	LABEL,DOOR,FRENCH EMP
2	640-0200-00	LABEL,EMP PAPER DOOR,GERMAN
2	640-0228-00	LABEL,EMP PAPER DOOR,SPANISH
3	640-0066-01	LABEL,EMP REAR PANEL,M/L,EN,FR,SP,JA
3	640-0119-01	LABEL,SP02 REAR PANEL,M/L,EN,FR,SP
3	640-0176-00	LABEL,SP02,REAR PANEL,JAPANESE
3	640-0201-00	LABEL,EMP REAR PANEL,GERMAN
3	640-0206-00	LABEL,SPO2 REAR PANEL,GERMAN
4	640-0011-00	LABEL, PRODUCT SERIAL NUMBER WITH CSA
4	640-0069-00	LABEL,SAFETY AGENCY
4	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
4	640-0069-00	LABEL,SAFETY AGENCY
5	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
7	010-0124-00	SUB-ASSY,POWER HARNESS,EXPANSION MODULE
8	600-0006-00	LENS, LED, GREEN
9	031-0025-01	PCB ASSY,PRINTER MAIN BOARD,M/L
10	600-0013-00	PAD,FOOT,WHITE,.5" SQ. X.12" HIGH,SILICONE
11	600-0286-00	CORD,O RING,1.5MM (.059) DIA
12	640-0072-00	LABEL,FILLER PANEL COVER
12	640-0169-00	LABEL,WINDOW COVER,EMP-EL
13	600-0073-00	BRACKET,PRINTER
14	600-0154-00	GEAR ARM
15	600-0155-00	BRACKET,CHOKE
15	640-0069-00	LABEL,SAFETY AGENCY
16	600-0156-00	PAPER SPINDLE
16	620-0093-00	WASHER,#6 FLAT,SS,.150X.375X.033
16	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
17	640-0114-03	LABEL,SP02 CONNECTOR,GRAY,ENGLISH
17	640-0148-02	LABEL,SP02 CONNECTOR,GRAY,FRENCH
17	640-0177-01	LABEL,SPO2 CONNECTOR PANEL,JAPANESE,GRAY
17	640-0205-00	LABEL,SPO2 CONNECTOR PANEL,GERMAN

Reference Designator	Part Number	Description
CX Drawing Designator (Dwg. #824-0208-00), Expansion Module		
66	630-0056-00	PANEL,FRONT,EMP REEL
67	630-0017-04	CHASSIS,EMP
68	630-0018-03	PANEL,CHASSIS-REAR
69	630-0024-00	DOOR,BOTTOM
70	630-0025-00	LATCH,DOOR
71	630-0026-00	PANEL,FILLER
72	630-0030-00	PANEL,FILLER, TOP
73	630-0031-00	PANEL,FILLER-BOTTOM
74	640-0071-00	LABEL,FUSE,PRINTER BOARD
75	630-0062-00	PANEL,CO2-TOP
76	630-0071-00	PANEL,CO2-BOTTOM
77	610-0177-00	20 PIN NICOLAY CO2 CONNECTOR
78	660-0056-00	FLEX CIRCUIT,CO2
79	610-0196-00	CONNECTOR,20 POS,2 ROW,FEMALE
80	031-0029-02	ASSY,CO2 PCB
81	640-0239-00	LABEL,CO2 CONNECTOR PANEL
82	600-0168-00	TUBING,.50IDX.63OD,VINYL,CLEAR
83	620-0042-00	SCREW,4-40X3/8,BH,PH,SS,W/NYPATCH
84	352-0002-00	CORE,MAGN,1.50"L,1.00"W,48"T,.075X1.05"SLOT
85	600-0283-00	BRACKET,C02 FERRITE BEAD
87	620-0110-00	SCREW,SEM,METRIC,3X6,PH,PH,ZINC,STEEL
88	600-0300-00	SHIELD,MS CO2
89	600-0299-00	SHIELD,EXPANSION CONNECTOR
90	620-0092-00	WASHER,#6,SPLT LK,SS
92	640-0064-02	LABEL,DOUBLE BATTERY,REPLACEMENT
95	600-0158-00	BRACKET,PAPER GUIDE
97	500-0007-01	PRINTER,THERMAL HOT DOT,2 IN PAPER
98	620-0112-00	WASHER,#2,SHLD,.098ID,NYLON
99	620-0137-00	STANDOFF,5/16OD,0.115ID,0.625 LONG,NYL
99	620-0167-00	STANDOFF,5/16 OD,.115 ID,.375 LONG,NYLON
101	620-0166-00	SPACER,LED,5/8 LONG,NYLON
105	600-0236-00	ADHESIVE,EMP EL WINDOW
107	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
123	010-0112-00	SUB-ASSY,EXPANSION CABLE,EMP,M/L
124	010-0056-00	SUBASSY,PRINTER KEYPAD HARNESS/CO2 TO PRINTER
126	640-0120-00	LABEL, SPO2, FUSE
127	620-0162-00	MOUNT,CABLE TIE,ADHESIVE BACKED,1"SQ,NYLON
128	620-0036-00	TIE WRAP, NYLON, 3 1/2" LONG
129	010-0111-00	SUBASSY,EXPANSION CABLE,EMPS M/L
130	010-0054-00	ASSY,PRINTER/SP02 CABLE
133	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
135	620-0198-00	SCREW,4-40X.250 PHL,PHD,WITH EXTERNAL LOCK

Reference Designator	Part Number	Description
CX Drawing Designator (Dwg. #824-0208-00), Expansion Module		
136	600-0062-00	SHRINK TUBING,MP,BL,1/8"
137	031-0010-02	SUBASSY,PCB,SCRAP,SP02
138	610-0087-00	POLARIZING PIN, SOCKET KEY
138	620-0088-00	TIE-WRAP,1 1/4 BUNDLE DIA,NYLON,LOCKING
139	630-0082-00	BRACKET,PRINTERLESS CO2 OPTION
140	630-0079-00	COVER,PAPER OPENING
141	600-0303-00	PAD,DOOR LOCKING
142	620-0210-00	SCREW,.25-20X1.25,PHD,PH,STEEL ZINC,THRD FRMN
	824-0208-00	ASSEMBLY DRAWING,EXPANSION MODULE
	600-0284-00	GASKET,CO2 FERRITE BEAD
U11	433-0196-02	PROM,SCP,6.10.00,PROPAQ1XX
U11	433-0247-02	PROM,SCP,6.23.00
U11	433-0254-02	PROM,P10X,SCP,8.00.00

Reference Designator	Part Number	Description
CX Drawing Designator (Dwg. #824-0208-00), Expansion Module		
17	640-0224-00	LABEL,SPO2 CONNECTOR PANEL,SPANISH
18	600-0160-00	SPRING,PAPER TENSION
18	640-0119-01	LABEL,SP02 REAR PANEL,M/L,EN,FR,SP
19	600-0162-00	SHAFT,DOOR
20	600-0164-00	SUBASSY,GEAR BRACKET
21	600-0165-00	INSULATOR PAPER,PRINTER AREA
22	600-0166-00	O-RING,5 1/4ID,SECTION 1/16
23	600-0167-00	INSULATOR,FRP,PRINTER REAR
25	031-0008-00	SUBASSY,MAIN BOARD,SPO2
26	630-0033-00	KEY CAPS
28	320-0003-00	LED, GREEN,HLMP3950
30	610-0059-00	HOUSING,BLACK,30 AMP
31	620-0090-00	WASHER,#5,.140ID,9/32,.030THK,NYL,REDUCED OD
32	610-0060-00	HOUSING,RED,30 AMP
33	630-0038-00	LOCK,"D"CONNECTOR
34	030-0004-00	PCB,PRINTER KEYPAD
35	620-0035-00	SCREW, 6-32, 3/4" LONG, PAN HEAD, PHILLIPS, SS
36	620-0041-00	SCREW, SS, 4-40X1/2", PANHEAD, PHILLIPS
38	600-0237-00	COVER,EMP EL WINDOW
40	620-0065-00	WASHER,#8 SPLT LK SS
41	620-0074-00	SCREW,8-32,1.5"PH,NYLON,SLOTTED
42	620-0075-00	NUT,8-32,NYLON
44	620-0081-00	SPACER,#4,ID.116 OD,.187,.062THK,NYLON
46	620-0084-00	SCREW,8-32X1 1/2,BHD,SOCKET,SS,5/32 HEX HEAD
47	620-0135-00	SCREW,8-32X5/8L,PH,PH,NYL
48	620-0086-00	SPRING,.016 DIA WIRE,1"LONG,SS
49	600-0238-00	BRACE,EMPL EL WINDOW COVER
51	620-0089-00	WASHER,FLAT #8,.170X.375X.033,SS
52	620-0090-00	WASHER,#5,.140ID,9/32,.030THK,NYL,REDUCED OD
53	620-0091-00	SCREW,2-32X.19,TYPE B,PHD,PHL,SS
54	610-0055-00	HEADER,5-PIN
55	620-0093-00	WASHER,#6 FLAT,SS,.150X.375X.033
56	620-0094-00	SCREW,4-40X.25,PHL,PHD,SS
57	620-0124-00	SCREW, 4-40 X 1/4, PHL, PHD, SEMS
58	620-0095-00	EDGING,GROMMET
59	620-0096-00	RETAINER,SHAFT 3/16ID,TYPE 3,SS
60	620-0158-00	SCRW,6-19X.375,TF,PHL,PH,ST,ZINC,PLASTITE
61	620-0106-00	SCREW,4-24,PH,.25L,SLT,TYPE 25,STEEL,ZINC PL
61	620-0168-00	SCREW,4-24 X .625 PHL,PHD,TYPE 25
62	620-0100-00	SCREW,8-32X1.50,PH,PH,SS
65	630-0012-00	KEY, ELASTROMERIC
66	630-0015-00	PANEL,FRONT CHASSIS

Reference Designator	Part Number	Description
DI Drawing Designator (Dwg. #824-0226-00), EL Front Panel		
1	500-0026-00	PROPAQ HIGH BRIGHT DISPLAY MODULE
2	010-0019-00	WIRE HARNESS,ALARM LED
4	600-0007-00	LENS, LED, RED
5	600-0008-00	LENS, LED, AMBER
6	600-0211-01	ADHESIVE,PREFORM WINDOW
7	031-0016-50	SUB-ASSY,MULTILANGUAGE INTERCONNECT PCB
7	031-0016-51	SUBASSY,EL INTERCONNECT PCB,INTERNATIONAL
8	620-0157-00	RIVET,SNAP,NYLON,.039-.079 THICKNESS,WHITE
9	600-0212-01	SHIELD,NOMEX,M/L
13	600-0058-01	BRACE,PBA
14	630-0054-01	CLAMP,EL/LCD-TOP
15	630-0053-01	CLAMP,EL/LCD-BOTTOM
16	630-0012-00	KEY, ELASTROMERIC
17	500-0017-00	CEF WINDOW,EL PANEL
18	630-0050-01	FRONT PANEL,REEL
19	630-0033-00	KEY CAPS
20	600-0013-00	PAD,FOOT,WHITE,.5" SQ. X.12" HIGH,SILICONE
21	620-0137-00	STANDOFF,5/16OD,0.115ID,0.625 LONG,NYL
22	620-0150-00	SCREW,4-24X.88 PH,PH,TYPE 25
23	620-0152-01	SCRW,2-56X.38,SEMS,PHL,PHD,SPLT LKWASH/FLTWAS
24	620-0048-00	SCREW,6-32X.5,PH,PH,NYLOC,SS
29	620-0161-00	"O" RING,0.303 ID,0.070 THICK
30	600-0218-00	GASKET,ELECTRICALLY CONDUCTIVE SILICONE
31	504-0041-00	WIRE, SOLID, 24 AWG, UNINSULATED
32	032-0007-01	SUBASSY,M/L MAIN PCB,2ND LEVEL,PROPAQ EL
35	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
36	650-0001-00	ADHESIVE, LOCKTITE ELECTROBOND NO. 495
	824-0226-00	ASSY DWG,PROPAQ EL FRONT PANEL,M/L

Reference Designator	Part Number	Description
DJ Drawing Designator (Dwg. #824-0227-00), LCD Front Panel		
2	010-0019-00	WIRE HARNESS,ALARM LED
3	620-0106-00	SCREW,4-24,PH,.25L,SLT,TYPE 25,STEEL,ZINC PL
4	600-0007-00	LENS, LED, RED
5	600-0008-00	LENS, LED, AMBER
6	630-0044-01	BRACKET,FRONT PANEL (RIGHT)
7	630-0045-01	BRACKET,FRONT PANEL (LEFT)
8	500-0022-00	WINDOW,MONITOR,LCD
9	630-0033-00	KEY CAPS
10	600-0013-00	PAD,FOOT,WHITE,.5" SQ. X.12" HIGH,SILICONE
11	650-0018-00	TAPE, ACRYLIC FOAM, DOUBLE COATED 3/4 X.080
12	600-0056-00	GASKET,ADHESIVE,WINDOW
13	600-0058-01	BRACE,PBA
14	503-0021-00	SHIELD, LCD MODULE
15	620-0047-00	SCREW,6-32X.25,PH,PH,NYLOC,SS
16	620-0048-00	SCREW,6-32X.5,PH,PH,NYLOC,SS
18	630-0029-01	DRESS PANEL
19	630-0013-00	ADAPTER,KEY
20	630-0012-00	KEY, ELASTROMERIC
21	620-0036-00	TIE WRAP, NYLON, 3 1/2" LONG
22	620-0161-00	"O" RING,0.303 ID,0.070 THICK
23	031-0041-00	LCD DRIVER PCB
24	500-0006-00	PANEL,GLASS,ST LCD,CUSTOM
25	600-0210-01	INSULATOR,LCD,NOMEX
26	503-0016-01	PANEL, EL, WHITE 5LE
27	610-0021-00	CONNECTOR, 2 PIN, .100 CENTERS
28	600-0062-00	SHRINK TUBING,MP,BL,1/8"
29	600-0020-00	LCD BEZEL
30	504-0100-00	WIRE,26 AWG,8"X.375 TINNED,ORANGE
31	660-0002-00	CABLE, FLAT, LCD
32	650-0016-00	TAPE,1/4" DOUBLE SIDED ADHESIVE
33	504-0099-00	WIRE,26 AWG,8"X.375 TINNED BLACK
34	660-0001-00	CABLE FLAT, LCD, HEAT STAKEABLE
35	660-0003-00	CONNECTOR, ZEBRA
36	032-0006-00	SUBASSY,LCD/SIRECUST,M/L MAIN,2ND LVL,PROPAQ
37	504-0041-00	WIRE, SOLID, 24 AWG, UNINSULATED
	824-0227-00	ASSY DWG,FRONT CHASSIS,LCD MONITOR M/L

Reference Designator	Part Number	Description
DM Drawing Designator (Dwg. #824-0230-00), Rear Chassis		
2	010-0008-00	WIRE HARNESS,MAIN PCB-RECHARGER PCB
2	501-0007-00	BATTERY ASSY,FUSED,SINGLE
3	600-0013-00	PAD,FOOT,WHITE,.5" SQ. X.12" HIGH,SILICONE
4	010-0062-00	ASSY,THERMISTOR CABLE, EL MONITOR
5	650-0013-00	GLUE,HOT MELT
6	600-0084-00	CUSHION, BATTERY PACK
7	660-0005-01	CABLE ASSY,BATTERY PACK
8	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
9	010-0006-01	SUBASSY,WIRE HARNESS EXP. CONNECTOR
11	620-0162-00	MOUNT,CABLE TIE,ADHESIVE BACKED,1"SQ,NYLON
13	610-0036-00	CONNECTOR, 5 PIN, .156 CENTERS
16	640-0168-00	LABEL,FUSE,EL MONITOR
16	640-0168-01	LABEL,FUSE,EL M/L MONITOR*
16	640-0185-00	LABEL,SMALL ACUITY LOGO
18	620-0036-00	TIE WRAP, NYLON, 3 1/2" LONG
22	032-0010-00	ASSY,2ND LEVEL,RECHARGER PCB,LCD M/L
22	032-0011-00	ASSY,2ND LEVEL,RECHARGER PCB,EL M/L
22	032-0013-00	ASSY,2ND LEVEL,RECHARGER PCB,LCD M/L
24	600-0049-00	ADHESIVE PREFORM-SIDE PANEL
26	600-0035-01	CLAMP,SIDE PANEL
26	600-0257-00	CLAMP,PANEL LEFT SIDE 106 SIEMENS&HP OPTION
27	620-0042-00	SCREW,4-40X3/8,BH,PH,SS,W/NYPATCH
30	600-0214-00	CLAMP,RIGHT SIDE PANEL, BOTTOM
31	600-0215-00	CLAMP,RIGHT SIDE PANEL - TOP
32	600-0078-00	TUBING,SILICONE,.104X.192
33	600-0115-00	VALVE, CHECK
37	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
40	600-0179-00	TUBING,.125ID,.250OD,SILICONE
41	600-0016-00	FITTING, 3/32" ID, TEE, NYLON
42	600-0221-00	FITTING,1/8ID-3/32ID ELBOW,WHT NYLON
43	600-0059-00	FITTING, 3/32" ID, ELBOW, NYLON
46	600-0222-00	FITTING,TEE,3/32ID(2),1/8ID STEM,WHT NYLON
47	600-0178-00	FITTING,1/8"ID TUBE,ELBOW,NYL
52	600-0043-00	PLASTIC TEE, 1/8" ID BARB, NYLON

Reference Designator	Part Number	Description
DM Drawing Designator (Dwg. #824-0230-00), Rear Chassis		
53	600-0033-01	INSULATOR,ISO-NONISO,ASF,VANE
53	600-0279-00	SHIELD,FRP PAPER,REAR CHASSIS,M/L
54	600-0018-00	IN-LINE FILTER
55	010-0020-04	SUBASSY,EL RIGHT SIDE PANEL
55	010-0110-01	SUBASSY,M/L RIGHT SIDE PANEL,DEFIB SYNC
55	010-0120-01	SUBASSY,M/L RIGHT SIDE PANEL,NO DEFIB SYNC
56	010-0106-00	SUB-ASSY,LEFT SIDE PANEL,HP M/L
56	010-0107-00	SUB-ASSY,LEFT SIDE PANEL,AAMI 102/104 M/L
56	010-0108-00	SUBASSY,LEFT SIDE PANEL,AAMI 106 M/L
56	010-0109-00	SUBASSY,LEFT SIDE PANEL,CSA,SIRECUST M/L
57	600-0301-00	PAD,FOOT,WHITE,.5"SQX.093"THK,BUNA-N
	824-0230-00	ASSY DWG,REAR CHASSIS,M/L

Reference Designator	Part Number	Description
DN Drawing Designator (Dwg. #824-0231-00), LCD Monitor		
14	600-0175-00	CORD,O RING,1.6MM (.063)DIA.
15	620-0048-00	SCREW,6-32X.5,PH,PH,NYLOC,SS
17	600-0067-00	HANDLE,COATED,MONITOR
18	650-0011-00	TAPE,NON-SKID
	824-0231-00	ASSY,DWG,MONITOR,LCD,M/L
DO Drawing Designator (Dwg. #824-0232-00), EL Monitor		
4	600-0175-00	CORD,O RING,1.6MM (.063)DIA.
5	620-0048-00	SCREW,6-32X.5,PH,PH,NYLOC,SS
7	600-0067-00	HANDLE,COATED,MONITOR
8	650-0011-00	TAPE,NON-SKID
	824-0232-00	ASSY DWG,MONITOR,EL,M/L

REV.	CHANGE ORDER/WHY	DATE	CHECKED BY
B	CO 920116	5/16/92	JPO
C	CO 930281	6/28/93	

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B	CO 920116	5/16/92	JPO
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B	CO 920116	5/16/92	JPO
C	CO 930281	6/28/93	

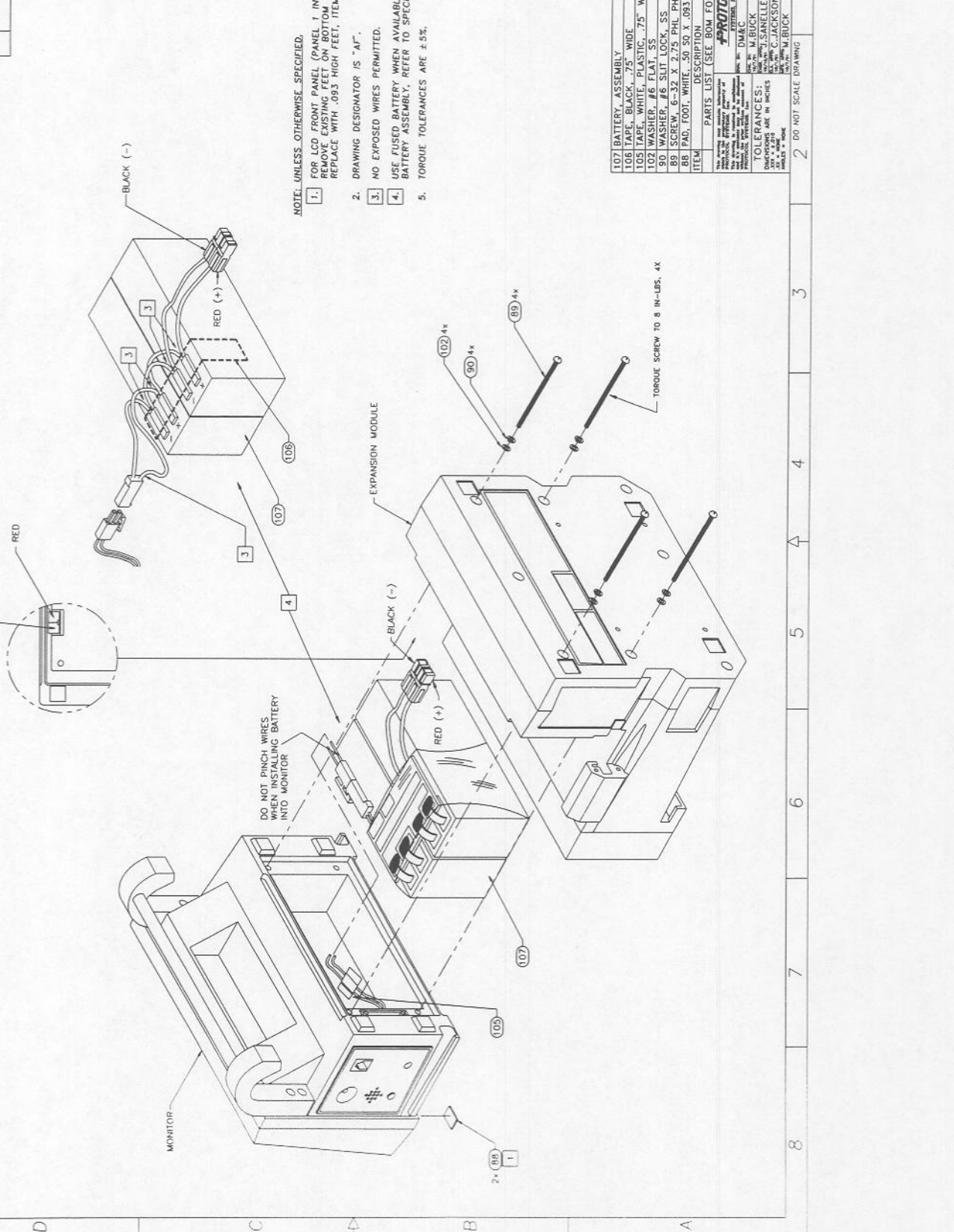
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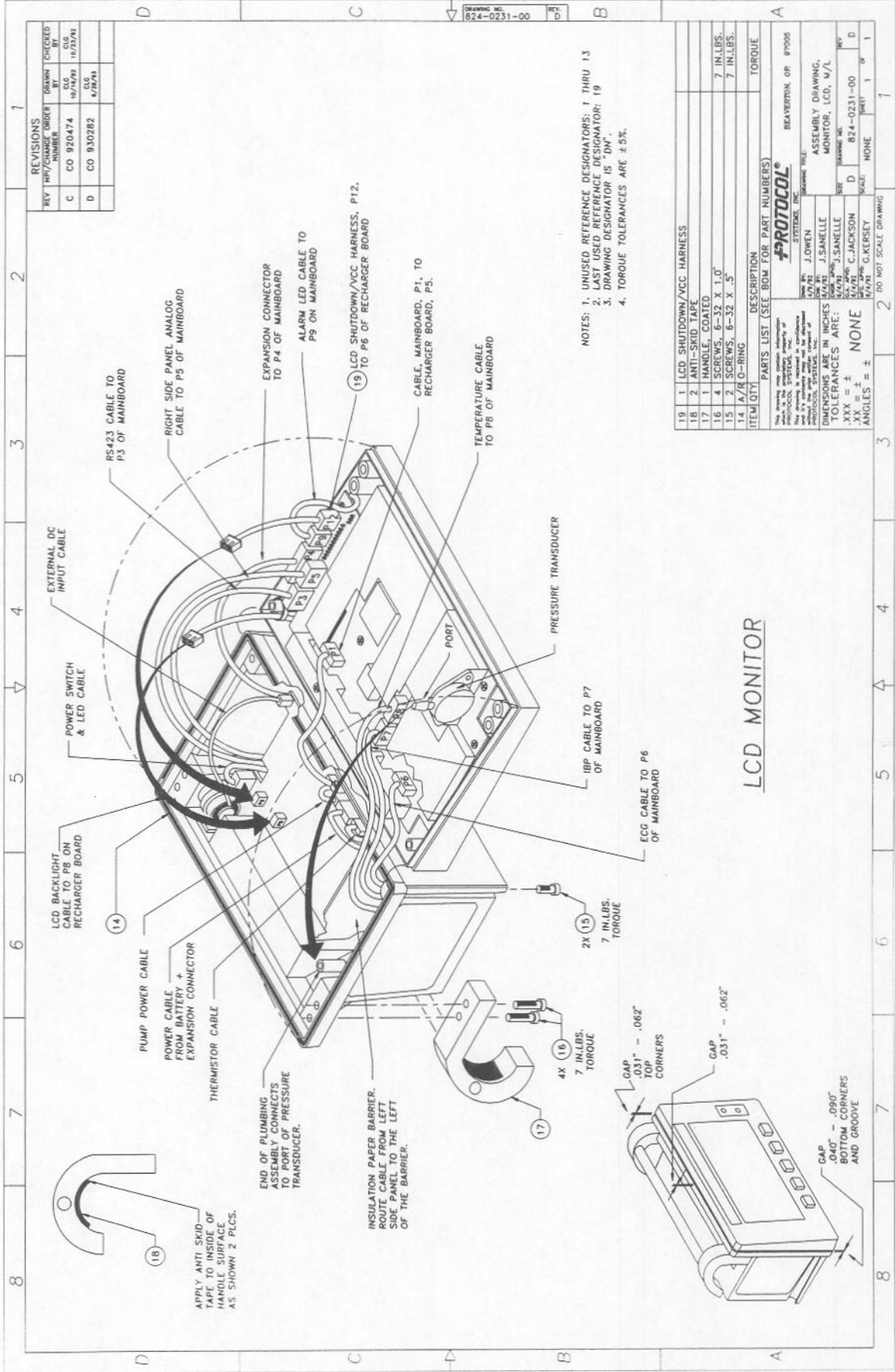
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C	CO 930281	6/28/93	



- NOTE: UNLESS OTHERWISE SPECIFIED,
- FOR LCD FRONT PANEL (PANEL 1 INCH THICK AT BASE), REMOVE EXISTING FEET ON BOTTOM OF PANEL AND REPLACE WITH .093 HIGH FEET, ITEM 88.
 - DRAWING DESIGNATOR IS "A".
 - NO EXPOSED WIRES PERMITTED.
 - USE FUSED BATTERY WHEN AVAILABLE, FOR CORRECT BATTERY ASSEMBLY, REFER TO SPECIFIC BOM.
 - TORQUE TOLERANCES ARE $\pm 5\%$.

107	BATTERY, ASSEMBLY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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REV	IMP/CHANGE ORDER NUMBER	DATE	CHECKED BY
A	CO 920142	4/14/92	CLG
B	CO 930283	6/28/93	CLG

NOTE:

1. THIS ASSEMBLY DRAWING HAS A DRAWING DESIGNATOR "D".
2. AFTER FRONT CHASSIS IS ASSEMBLED, PLUG THE CONNECTOR FROM LED CABLE, ITEM 2, TO P9 OF MAIN BOARD, ITEM 32.
3. COMPLETE PAPERWORK AND PLACE ASSEMBLY IN AN ANTISTATIC BAG.
4. CAUTION: REAR SURFACE OF WINDOW IS EXTREMELY FRAGILE. HANDLE WITH COTTON GLOVES.
5. TORQUE TOLERANCES ARE $\pm 5\%$.

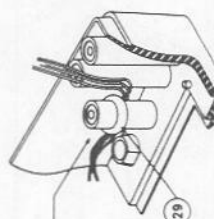
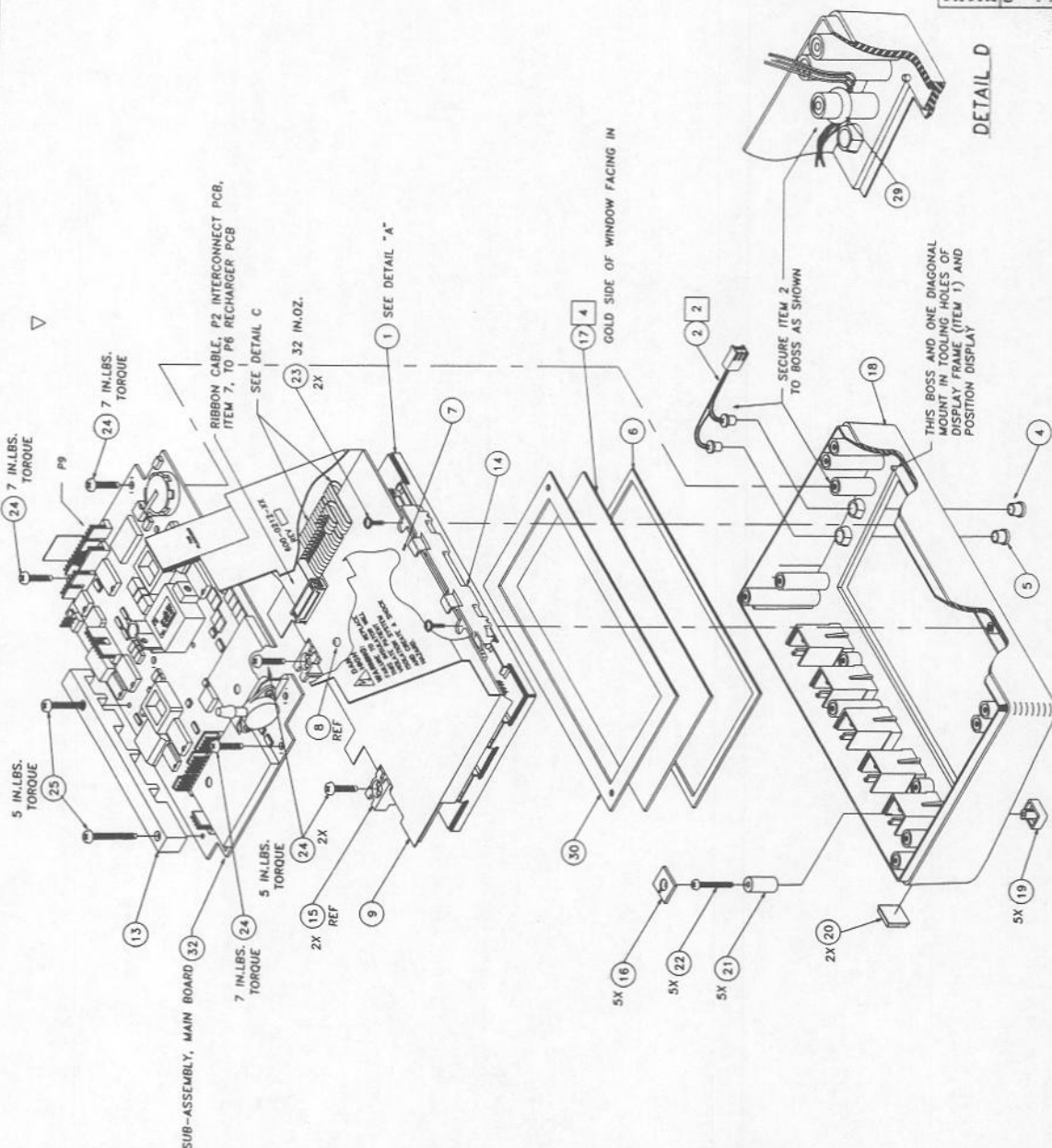
ITEM	DESCRIPTION	TORQUE
37	HEADER, 26-PIN	
32	SUB-ASSEMBLY, MAIN BOARD	
31	24 AWG BARE COPPER WIRE	
30	GASKET, ELECTRICALLY CONDUCTIVE SILICONE	
29	O-RING, .303 ID, .070 THICK	
25	SCREW, 6-32 X 1.0 PHL PHD	5 IN.LBS.
24	SCREW, 6-32 X .50 PHL PHD	5.87 IN.LBS.
23	SCREW, 2-56 X .38 PHL PHD SEMS	32 IN.OZ.
22	SCREW, 4-24 X .88 PHL PHD	32 IN.OZ.
21	STANDOFF, .63 LONG, NYLON	
20	FOOT PAD, .50 SQ, WHITE	
19	KEY CAP, GREY	
18	EL FRONT PANEL	
17	WINDOW	
16	KEY, ELASTOMERIC	
15	CLAMP, EL/LCD, BOTTOM	
14	CLAMP, EL/LCD, TOP	
13	BRACE, PCB	
9	SHIELD, NOMEX	
8	RIVET, SNAP, .039 - .079 CLAMP THICKNESS	
7	SUB-ASSEMBLY, EL MAIN INTERCONN PCB	
6	GASKET, WINDOW	
5	LENS, LED, AMBER	
4	LENS, LED, RED	
2	WIRE HARNESS, ALARM LED	
1	SUB-ASSEMBLY, EL DISPLAY	

ITEM	DESCRIPTION	TORQUE
37	HEADER, 26-PIN	
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20	FOOT PAD, .50 SQ, WHITE	
19	KEY CAP, GREY	
18	EL FRONT PANEL	
17	WINDOW	
16	KEY, ELASTOMERIC	
15	CLAMP, EL/LCD, BOTTOM	
14	CLAMP, EL/LCD, TOP	
13	BRACE, PCB	
9	SHIELD, NOMEX	
8	RIVET, SNAP, .039 - .079 CLAMP THICKNESS	
7	SUB-ASSEMBLY, EL MAIN INTERCONN PCB	
6	GASKET, WINDOW	
5	LENS, LED, AMBER	
4	LENS, LED, RED	
2	WIRE HARNESS, ALARM LED	
1	SUB-ASSEMBLY, EL DISPLAY	

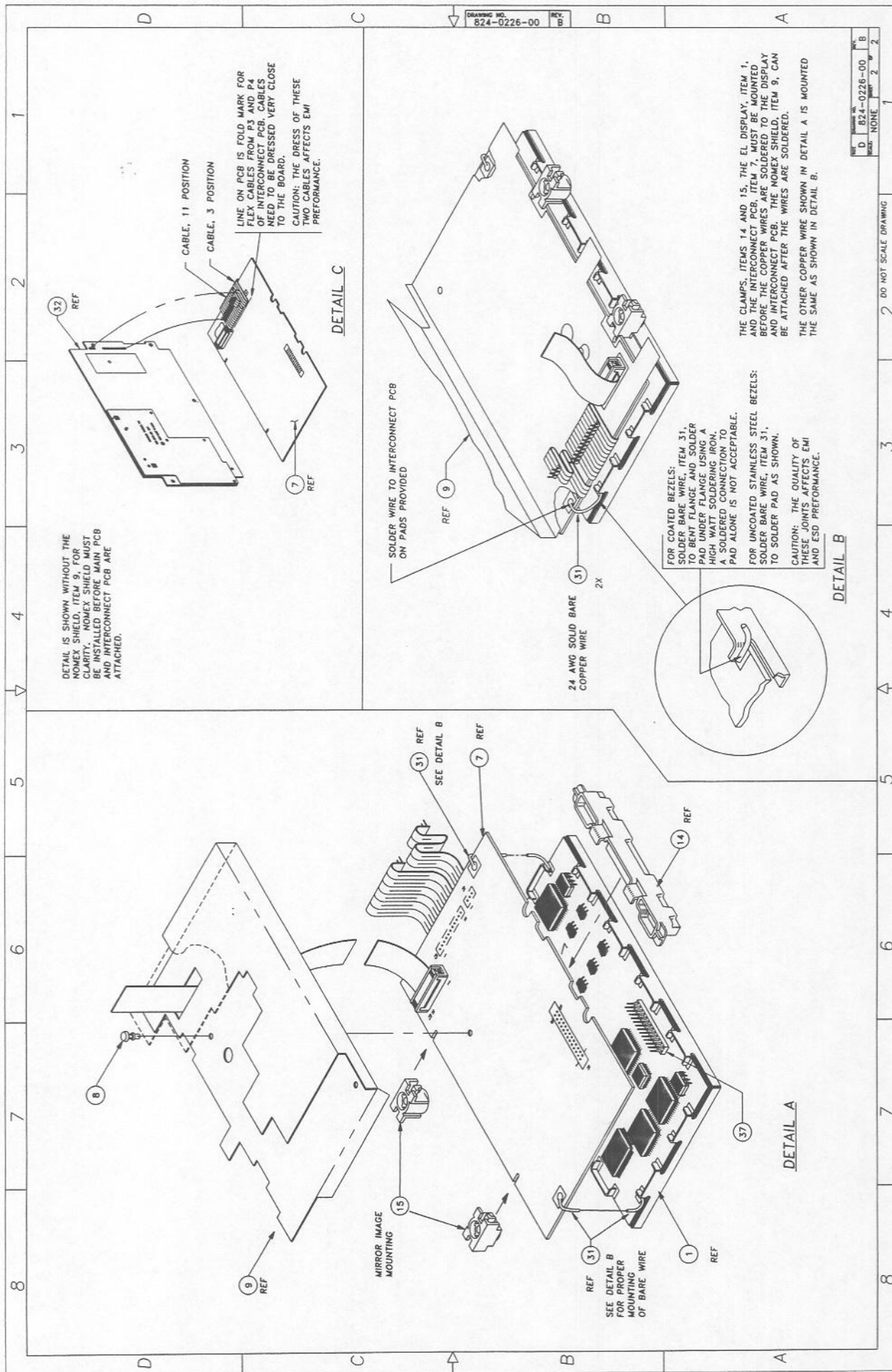
ITEM	DESCRIPTION	TORQUE
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13	BRACE, PCB	
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8	RIVET, SNAP, .039 - .079 CLAMP THICKNESS	
7	SUB-ASSEMBLY, EL MAIN INTERCONN PCB	
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5	LENS, LED, AMBER	
4	LENS, LED, RED	
2	WIRE HARNESS, ALARM LED	
1	SUB-ASSEMBLY, EL DISPLAY	

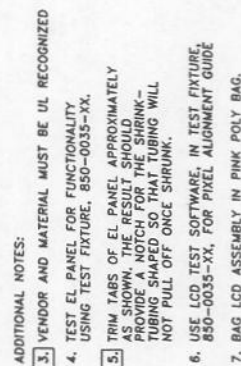
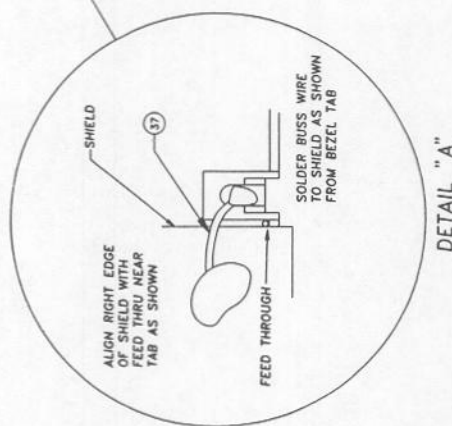
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4	LENS, LED, RED	
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1	SUB-ASSEMBLY, EL DISPLAY	



DETAIL D

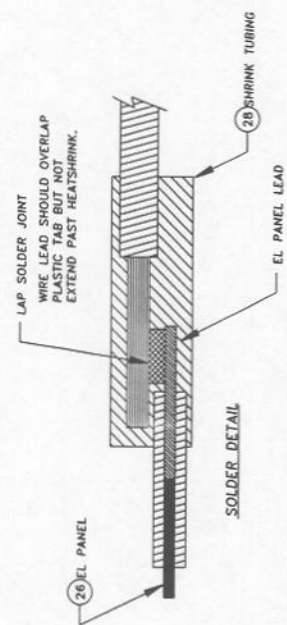
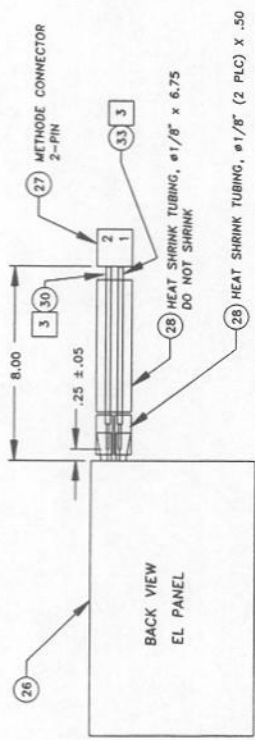
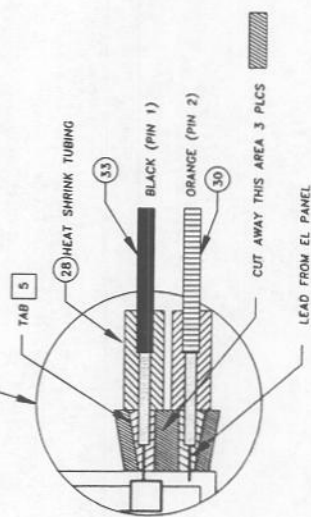
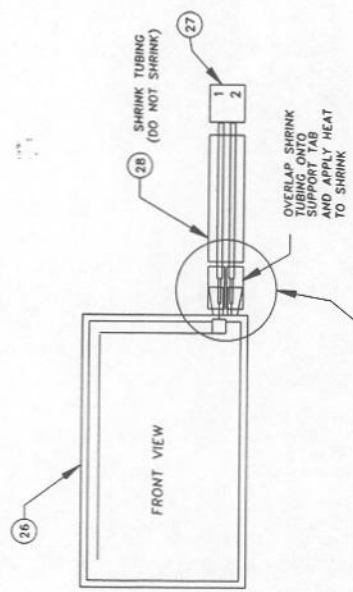




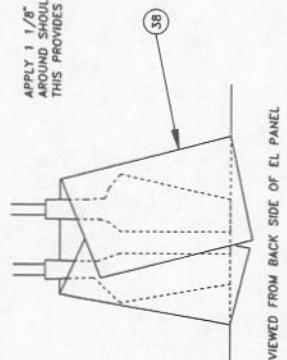
38	3/4" BLACK VINYL TAPE
37	WIRE, BUSS, 24 AWG
35	CONNECTOR, ZEBRA STRIP
34	CABLE, HEATSTAKE
33	WIRE, BLACK, 26 AWG
32	ADHESIVE, DOUBLE STICK, 1/4"
31	CABLE, FLAT, LCD 11 PIN
30	WIRE, ORANGE, 26 AWG
29	BEZEL, LCD
28	TUBING, HEATSHRINK, 1/8"
27	CONNECTOR, 2 PIN
26	LAMP, ELECTROLUMINESCENT (EL)
24	PANEL, LCD GLASS
23	PCB, LCD DRIVER
14	SHIELD, COPPER/NOISE
ITEM4	RADIOS LIST ASSE BOM FOR PART NUMBERS DESCRIPTION

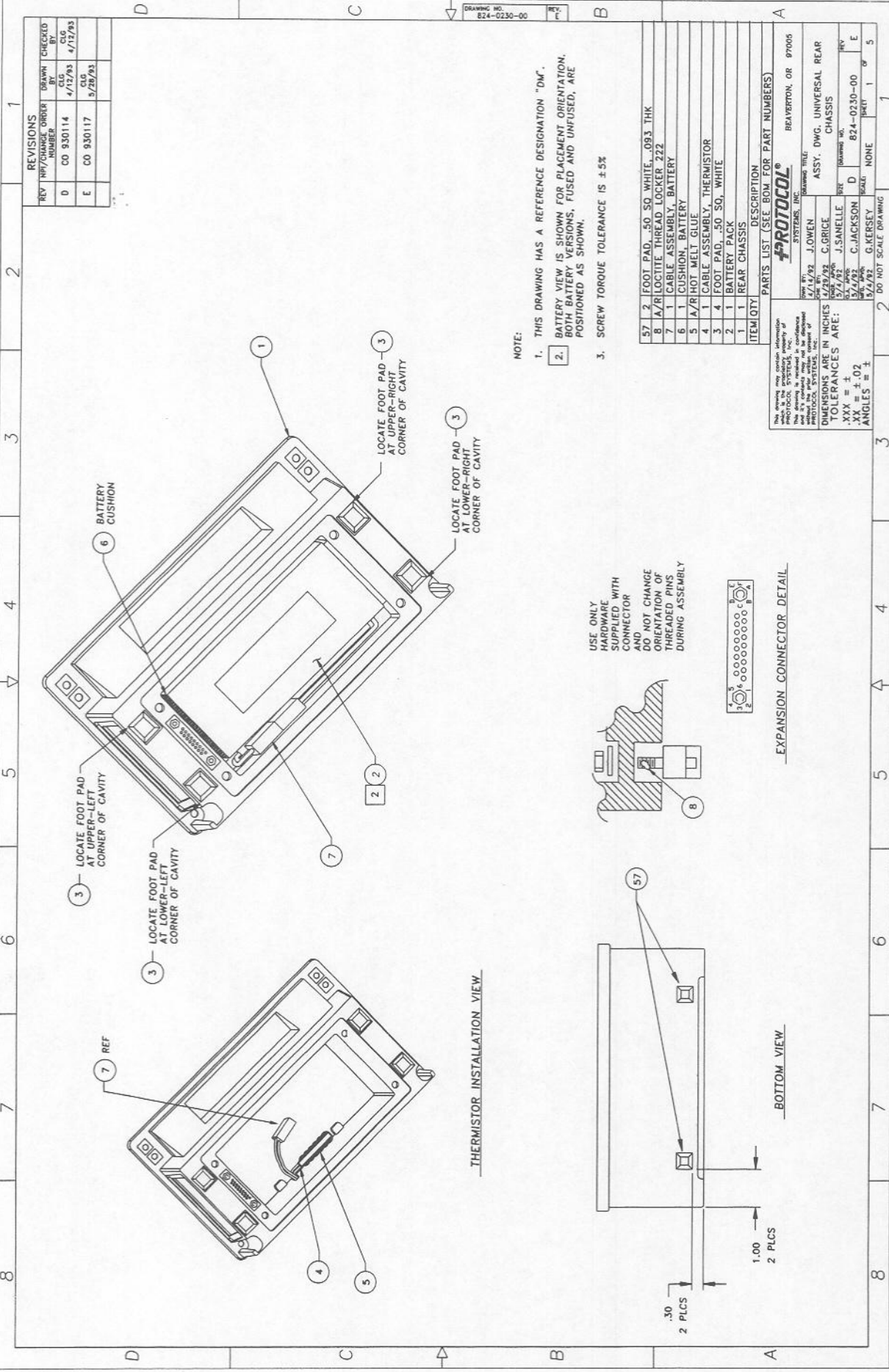
[illegible]

WIRING LIST	
ITEM	COLOR
30	ORANGE
33	BLACK
DESTINATION	
PIN 2	PIN 1



APPLY 1 1/8" PIECE OF BLACK ELECTRICAL TAPE (ITEM 38), AROUND SHOULDERS OF EL PANEL AS SHOWN BELOW. THIS PROVIDES ADDITIONAL STABILITY TO EL PANEL LEADS.



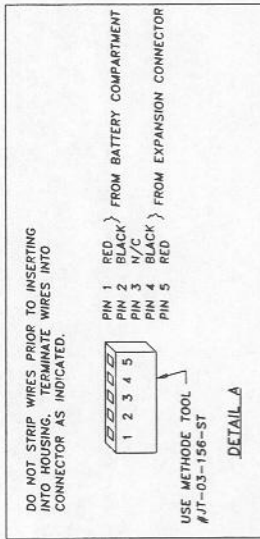


ITEM	QTY	DESCRIPTION
57	2	FOOT PAD, .50 SQ WHITE, .093 THK
8	A/R	LOCITITE THREAD LOCKER 222
7	1	CABLE ASSEMBLY, BATTERY
6	1	CUSHION, BATTERY
5	A/R	HOT MELT GLUE
4	1	CABLE ASSEMBLY, THERMISTOR
3	4	FOOT PAD, .50 SQ, WHITE
2	1	BATTERY PACK
1	1	REAR CHASSIS

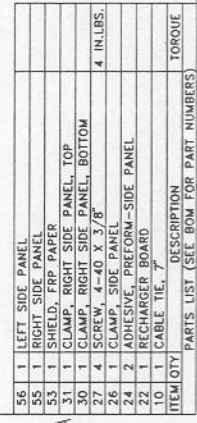
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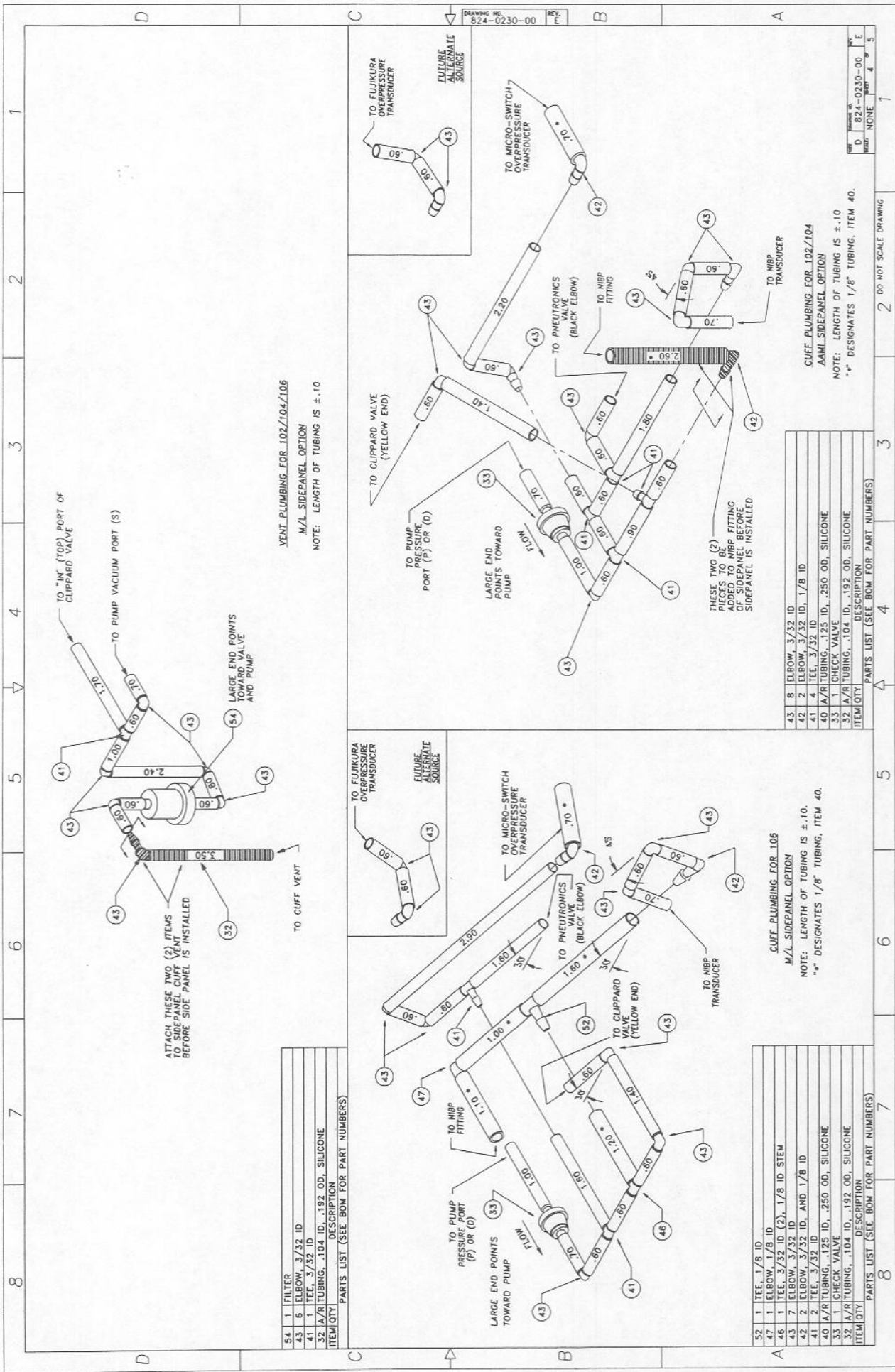
REV	DATE	BY	CHKD	DESCRIPTION
D	CO 930114	4/12/93	CLG	
E	CO 930117	5/28/93	CLG	

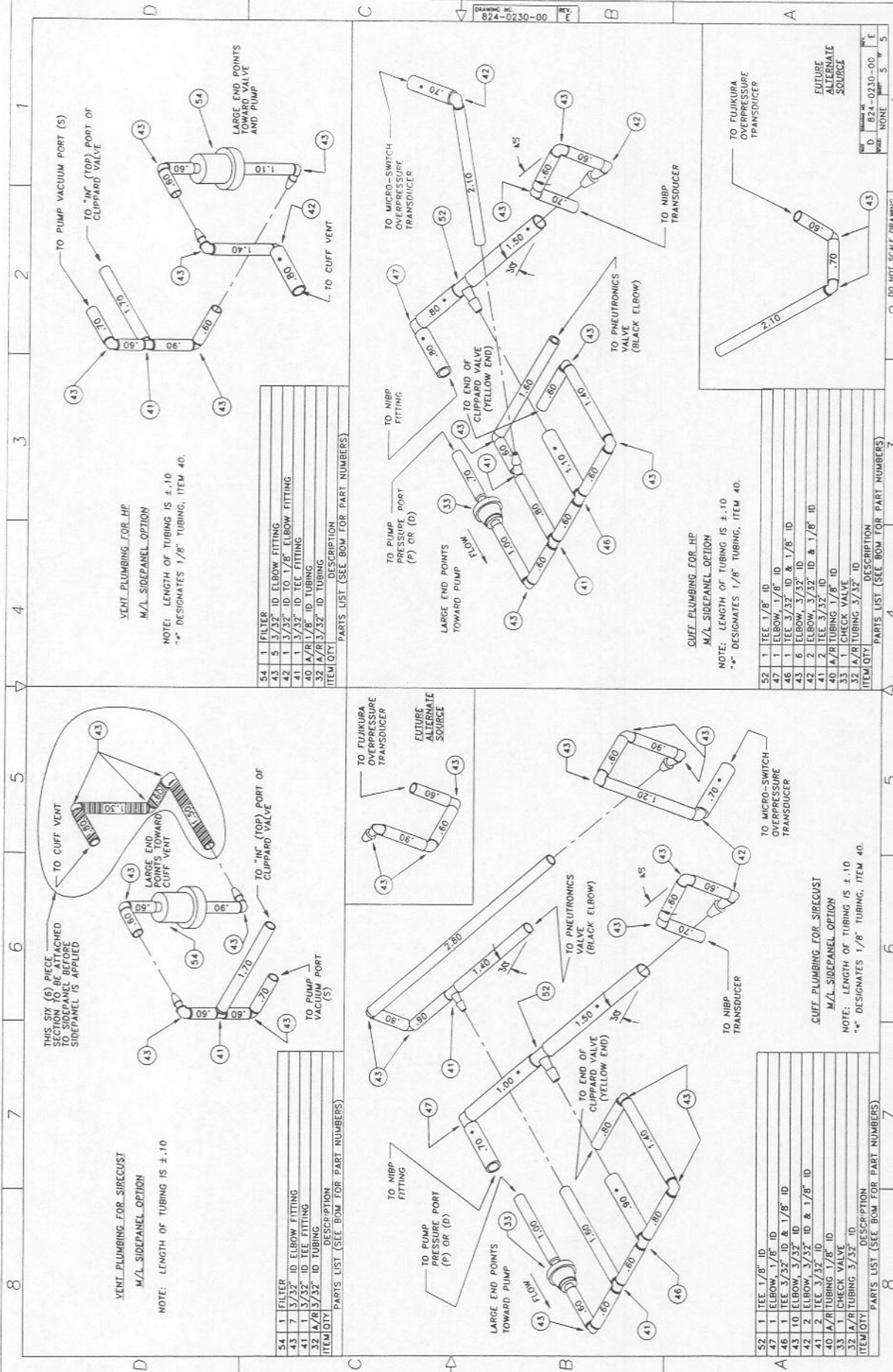
REV	DATE	BY	CHKD	DESCRIPTION
D	CO 930114	4/12/93	CLG	
E	CO 930117	5/28/93	CLG	



18	2	TIE WRAP, NYLON, 3.5" LONG
16	1	LABEL, RECHARGER
13	1	CONNECTOR, 5-PIN, .156 CTRS.
11	2	TIE WRAP MOUNT
9	1	CABLE ASSEMBLY, EXPANSION
ITEM	QTY	DESCRIPTION
PARTS LIST (SEE ROW FOR PART NUMBERS)		







DO NOT SCALE DRAWING

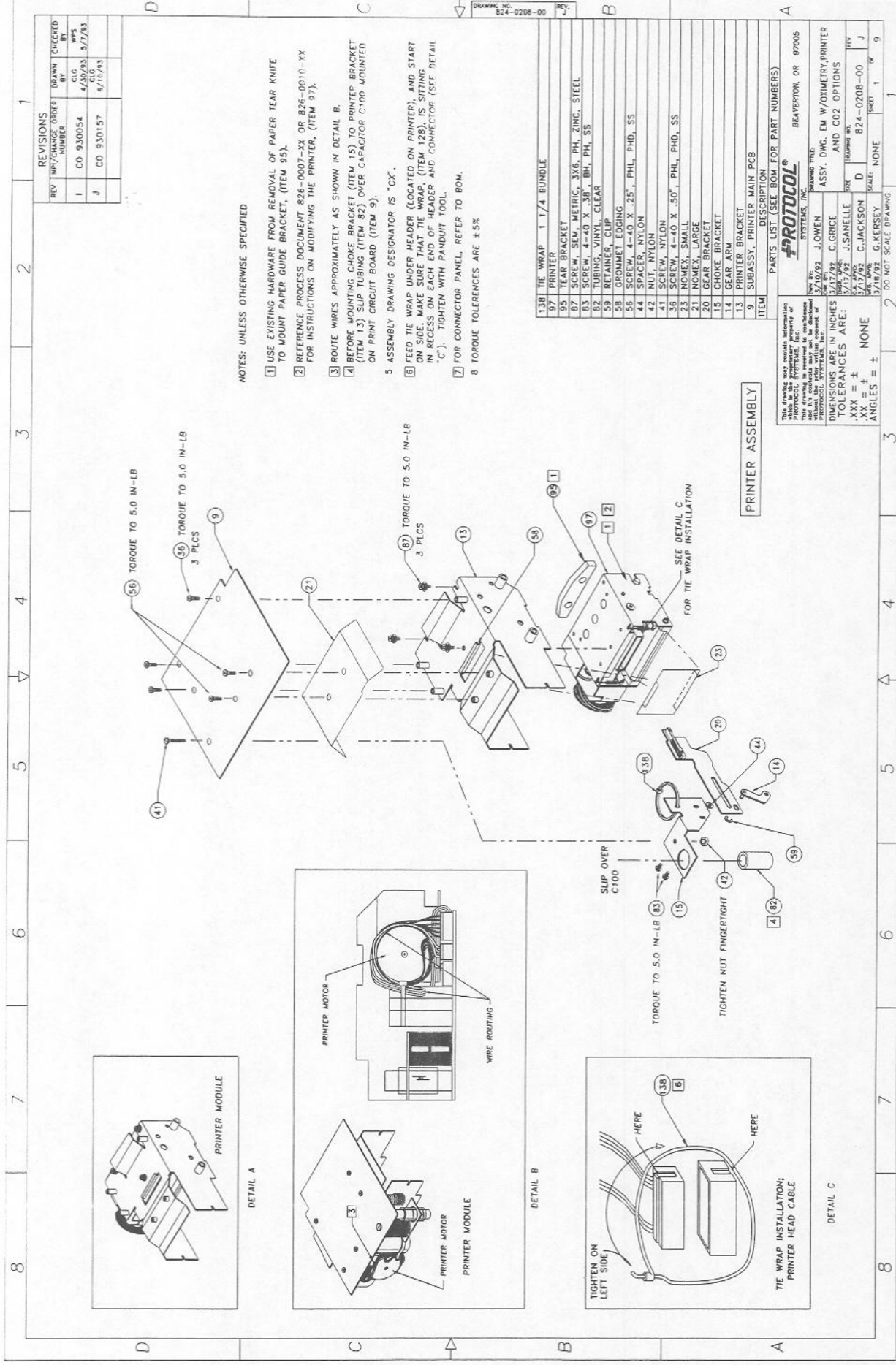
REV. 1

824-0230-00

DATE: 10/1/80

BY: J. E. 5

1 2 3 4 5 6 7 8



NOTES: UNLESS OTHERWISE SPECIFIED

- 1 USE EXISTING HARDWARE FROM REMOVAL OF PAPER TEAR KNIFE TO MOUNT PAPER GUIDE BRACKET, (ITEM 95).
- 2 REFERENCE PROCESS DOCUMENT 826-0007-XX OR 826-0010-XX FOR INSTRUCTIONS ON MODIFYING THE PRINTER, (ITEM 97).
- 3 ROUTE WIRES APPROXIMATELY AS SHOWN IN DETAIL B.
- 4 BEFORE MOUNTING CHOKE BRACKET (ITEM 15) TO PRINTER BRACKET (ITEM 13) SLIP TUBING (ITEM B2) OVER CAPACITOR C100 MOUNTED ON PRINT CIRCUIT BOARD (ITEM 9).
- 5 ASSEMBLY DRAWING DESIGNATOR IS "CX".
- 6 FEED TIE WRAP UNDER HEADER (LOCATED ON PRINTER), AND START ON SIDE. MAKE SURE THAT TIE WRAP, (ITEM 128), IS SITTING IN RECESS ON EACH END OF HEADER AND CONNECTOR (SEE DETAIL "C"). TIGHTEN WITH PANDUIT TOOL.
- 7 FOR CONNECTOR PANEL, REFER TO BOM.
- 8 TORQUE TOLERANCES ARE $\pm 5\%$

ITEM	DESCRIPTION
138	TIE WRAP 1 1/4 BUNDLE
97	PRINTER
95	TEAR BRACKET
87	SCREW, SEM. METRIC, 3X6, PH, ZINC, STEEL
83	SCREW, 4-40 X .38", BH, PH, SS
82	TUBING, VINYL, CLEAR
59	RETAINER, CLIP
58	GROMMET EDGING
56	SCREW, 4-40 X .25", PH, PHD, SS
44	SPACER, NYLON
42	NUT, NYLON
36	SCREW, 4-40 X .50", PH, PHD, SS
23	NOMEX, SMALL
21	NOMEX, LARGE
20	GEAR BRACKET
15	CHOKE BRACKET
14	GEAR ARM
13	PRINTER BRACKET
9	SUBASSY, PRINTER MAIN PCB

ITEM	DESCRIPTION
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97	PRINTER
95	TEAR BRACKET
87	SCREW, SEM. METRIC, 3X6, PH, ZINC, STEEL
83	SCREW, 4-40 X .38", BH, PH, SS
82	TUBING, VINYL, CLEAR
59	RETAINER, CLIP
58	GROMMET EDGING
56	SCREW, 4-40 X .25", PH, PHD, SS
44	SPACER, NYLON
42	NUT, NYLON
36	SCREW, 4-40 X .50", PH, PHD, SS
23	NOMEX, SMALL
21	NOMEX, LARGE
20	GEAR BRACKET
15	CHOKE BRACKET
14	GEAR ARM
13	PRINTER BRACKET
9	SUBASSY, PRINTER MAIN PCB

PROTOCOL SYSTEMS, INC.
 3710/92 J.OWEN
 3/17/92 C.GRICE
 3/17/92 J.SANELLE
 3/17/92 C.JACKSON
 3/17/92 G.KERSEY
 824-0208-00
 1 1 9
 DO NOT SCALE DRAWING

PRINTER ASSEMBLY

PRINTER MODULE

PRINTER MOTOR

WIRE ROUTING

PRINTER MODULE

PRINTER MOTOR

PRINTER MODULE

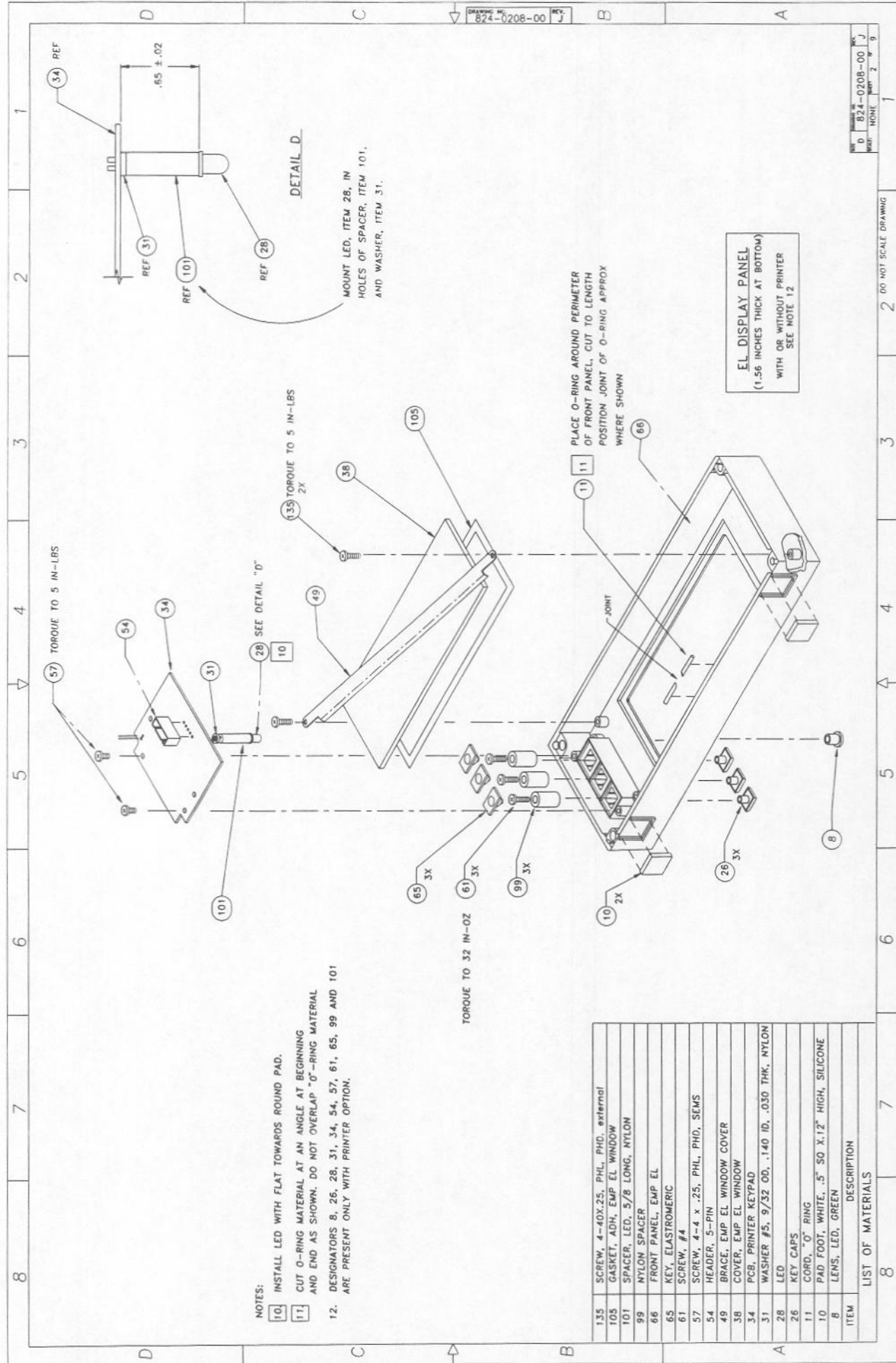
PRINTER MOTOR

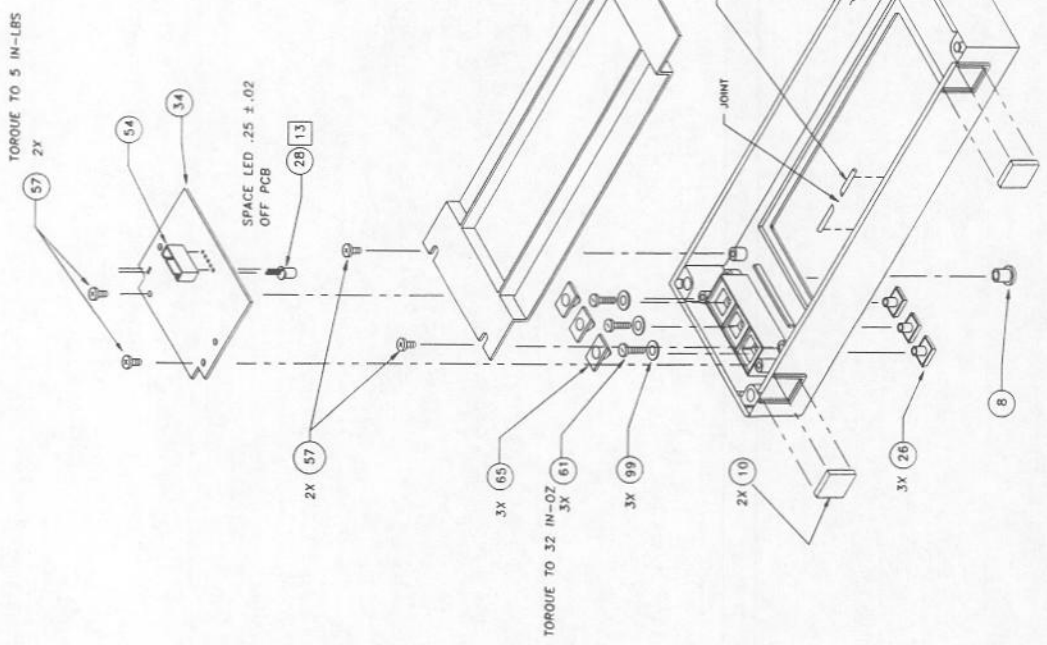
PRINTER MODULE

PRINTER MOTOR

PRINTER MODULE

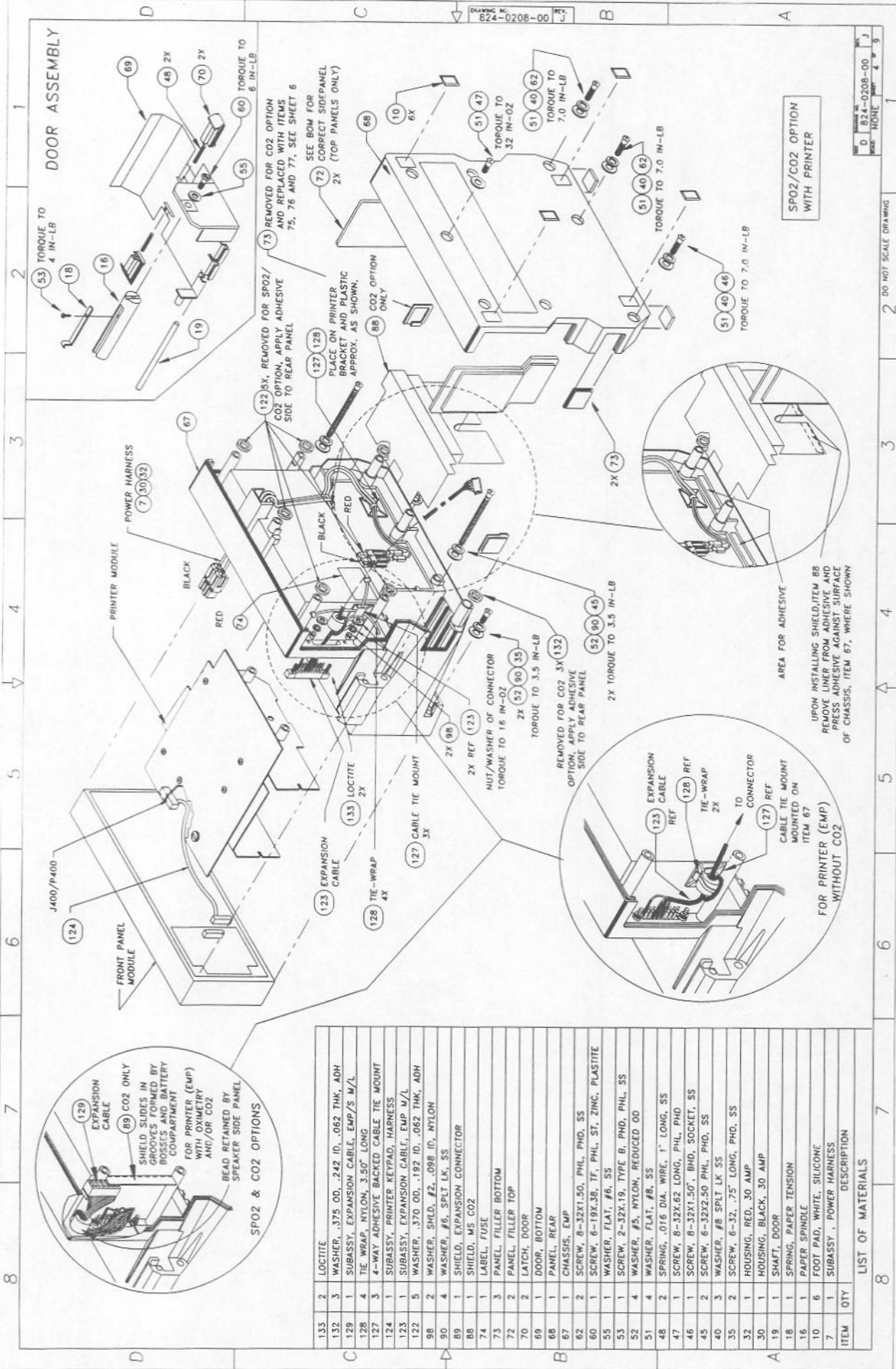
PRINTER MOTOR

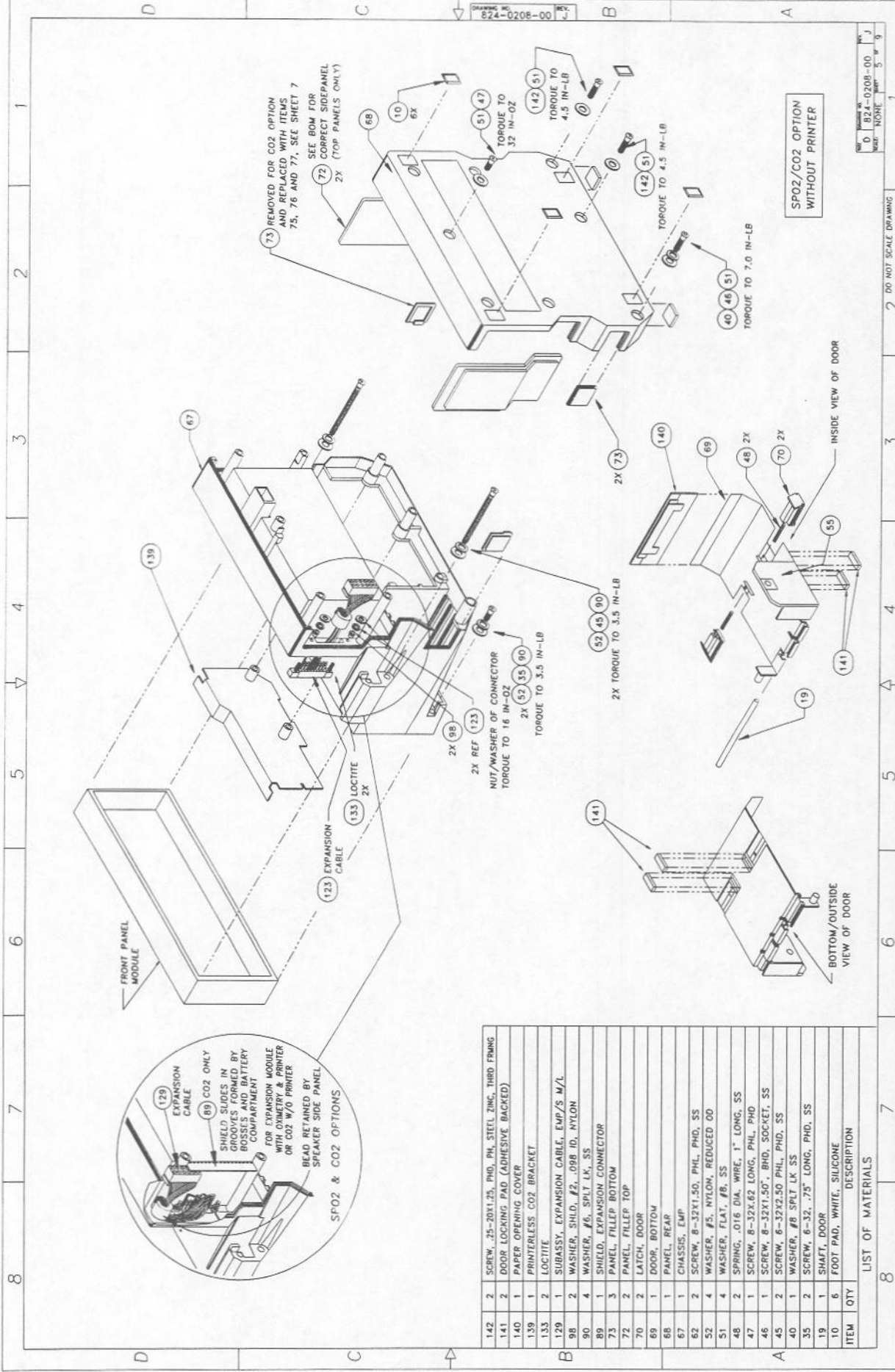




- NOTES:
- 3. INSTALL LED WITH FLAT TOWARDS ROUND PAD.
 - 4. CUT O-RING MATERIAL AT AN ANGLE AT BEGINNING AND END AS SHOWN. DO NOT OVERLAP "O"-RING MATERIAL.
 - 15. DESIGNATORS 8, 26, 28, 34, 54, 57, 61, 65 AND 99 ARE PRESENT ONLY WITH THE PRINTER OPTION.

LIST OF MATERIALS	
ITEM	DESCRIPTION
99	NYLON SPACER
71	PANEL FILLER
66	FRONT PANEL, EMP
65	KEY, ELASTOMERIC
61	SCREW, #4
57	SCREW, 4-40X.25, PHL, PHD, SEMS
54	HEADER, 5-PIN
34	PCB, PRINTER KEYPAD
28	LED
26	KEY CAPS
11	CORD, "O" RING
10	PAD, FOOT, WHITE, .5"SOX.12" HIGH, SILICONE
8	LENS, LED, GREEN



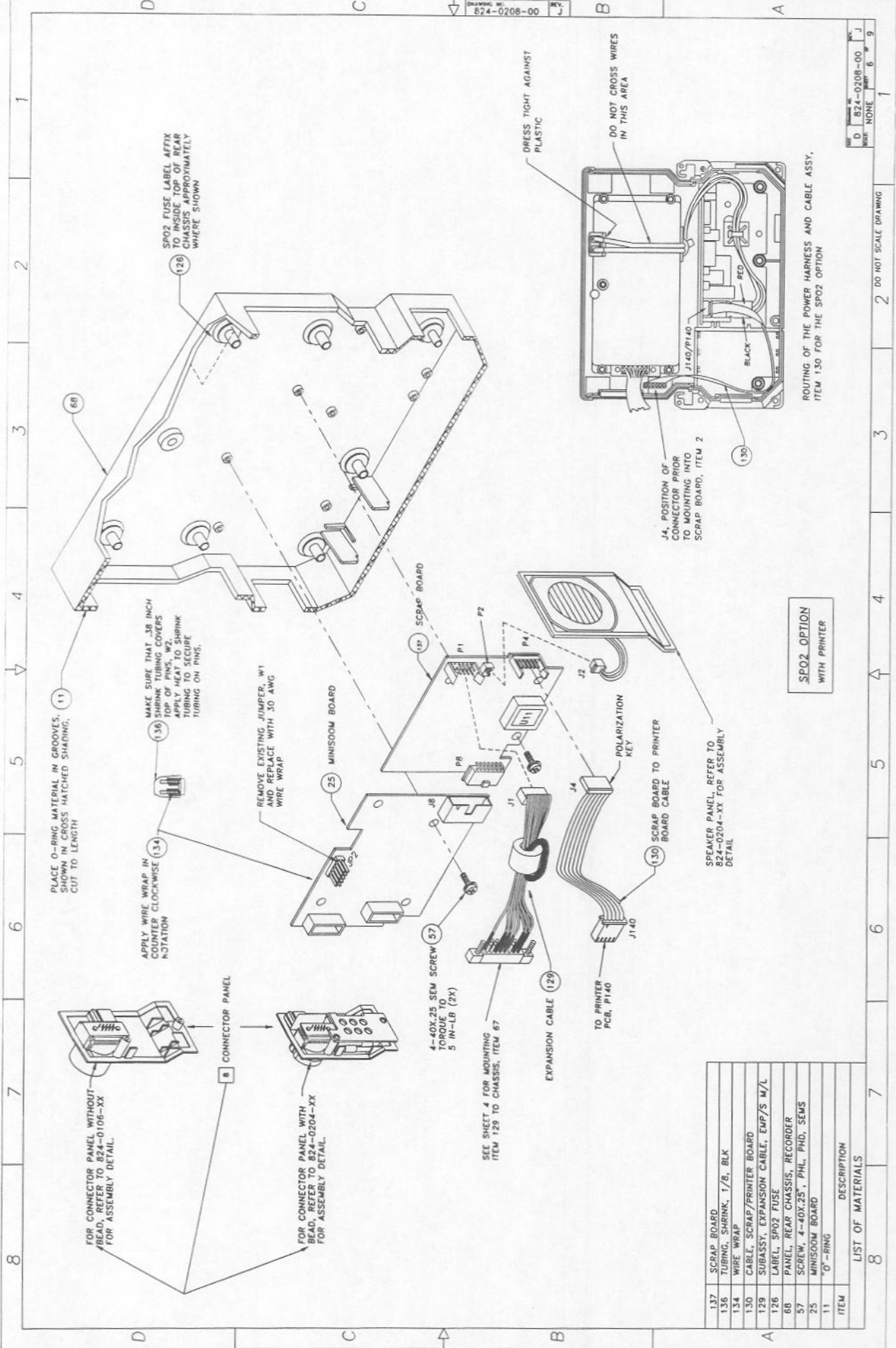


ITEM	QTY	DESCRIPTION
142	2	SCREW, .25-.20X1.25, PHD, PHL, STEEL ZINC, THRD FINING
141	2	DOOR LOCKING PAD (ADHESIVE BACKED)
140	1	PAPER OPENING COVER
139	1	PRINTERLESS CO2 BRACKET
133	2	LOCITE
129	1	SUBASSY, EXPANSION CABLE, EMP/S M/L
98	2	WASHER, SHLD, #2, .098 ID, NYLON
90	4	WASHER, #6, SPLIT LK, SS
89	1	SHIELD, EXPANSION CONNECTOR
73	3	PANEL, FILLER BOTTOM
72	2	PANEL, FILLER TOP
70	2	LATCH, DOOR
69	1	DOOR, BOTTOM
68	1	PANEL, REAR
67	1	CHASSIS, EMP
62	2	SCREW, 8-32X1.50, PHL, PHD, SS
52	4	WASHER, #5, NYLON, REDUCED OD
51	4	WASHER, FLAT, #8, SS
48	2	SPRING, .016 DIA, WIRE, 1" LONG, SS
47	1	SCREW, 8-32X.62 LONG, PHL, PHD
46	1	SCREW, 8-32X1.50, BHD, SOCKET, SS
45	2	SCREW, 8-32X2.50 PHL, PHD, SS
40	1	WASHER, #8 SPLIT LK SS
35	2	SCREW, 6-32, .75" LONG, PHD, SS
19	1	SHAFT, DOOR
10	6	FOOT PAD, WHITE, SILICONE

LIST OF MATERIALS

0 824-0208-00
REV 5
DATE 5-9

DO NOT SCALE DRAWING



SPO2 OPTION
WITH PRINTER

ROUTING OF THE POWER HARNESS AND CABLE ASSY.
ITEM 130 FOR THE SPO2 OPTION

REV	1	2	3	4	5	6	7	8	9
DATE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

ITEM	DESCRIPTION
137	SCRAP BOARD
136	TUBING, SHRINK, 1/8", BLK
134	WIRE WRAP
130	CABLE, SCRAP/PRINTER BOARD
129	SUBASST, EXPANSION CABLE, EMP/S M/L
126	LABEL, SPO2 FUSE
68	PANEL, REAR CHASSIS, RECORDER
57	SCREW, 4-40X.25", PHL, PHD, SEWS
25	MINISDOM BOARD
11	"O"-RING

LIST OF MATERIALS

PLACE O-RING MATERIAL IN GROOVES SHOWN IN CROSS HATCHED SHADING. CUT TO LENGTH

MAKE SURE THAT 3/8 INCH SHRINK TUBING COVERS. APPLY HEAT TO SHRINK TUBING TO SECURE TUBING ON PINS.

APPLY WIRE WRAP IN COUNTERCLOCKWISE ROTATION

REMOVE EXISTING JUMPER, W1 AND REPLACE WITH 30 AWG WIRE WRAP

CONNECTOR PANEL

FOR CONNECTOR PANEL WITHOUT BEAD, REFER TO 824-0204-XX FOR ASSEMBLY DETAIL.

FOR CONNECTOR PANEL WITH BEAD, REFER TO 824-0204-XX FOR ASSEMBLY DETAIL.

4-40X.25 SEWS SCREW 5 IN-LB (3X)

CONNECTOR, ITEM 79, MOUNTS INTO P5

SEE SHEET 4 FOR MOUNTING ITEM 129, TO CHASSIS, ITEM 67

EXPANSION CABLE, EMP/S W/L

4-WAY ADHESIVE BACKED CABLE TIE MOUNT

CABLE, SPO2 FUSE

GASKET, BRACKET

BRACKET, BEAD

FERRITE BEAD

CO2 BOARD

CONNECTOR, 20 POS.

CABLE, FLEX

CONNECTOR, NICOLAY

CONN. PANEL - BOTTOM

CONN. PANEL - TOP

PANEL, REAR CHASSIS, RECORDER

SCREW, 4-40X.25", PHL, PHD, SEWS

MINISOM BOARD

O-RING

SPO2/CO2 OPTION WITH PRINTER

ROUTING OF THE POWER HARNESS AND CABLE ASSY, ITEM 124 FOR CO2 OPTION.

NOTES: 16 INSERT (ITEM 138) KEYING PIN INTO P6 OF SOCKET (ITEM 79)

DO NOT CROSS WIPES IN THIS AREA

DRESS TIGHT AGAINST PLASTIC

FLEX CABLE, ITEM 78, DOES NOT WRAP AROUND POST

DETAIL F

TOP AND BOTTOM CO2 BOARD, CO2 BOARD, ITEM 77, WITH CONNECTOR, ITEM 75, SLIDE INTO PANEL AS SHOWN

ITEM 86, ADHESIVE TAPE, APPLIED TO BRACKET, ITEM 85

4-40 X .25 TORQUE TO 5 IN-LB

MINISOM BOARD

CO2 BOARD

EXPANSION CABLE

TO PRINTER PCB, P140

CONNECTOR GOES TO P3 OF CO2 BOARD, ITEM 80

CONNECTOR, ITEM 79, MOUNTS INTO P5

SEE SHEET 4 FOR MOUNTING ITEM 129, TO CHASSIS, ITEM 67

4-40X.25 SEWS SCREW 5 IN-LB (3X)

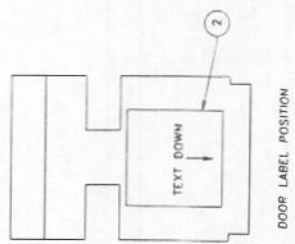
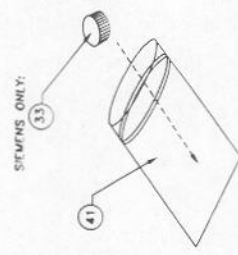
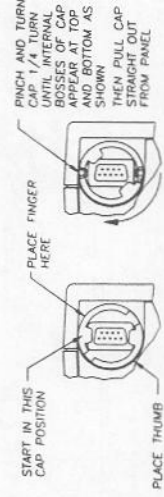
CONNECTOR, ITEM 79, MOUNTS INTO P5

SEE SHEET 4 FOR MOUNTING ITEM 129, TO CHASSIS, ITEM 67

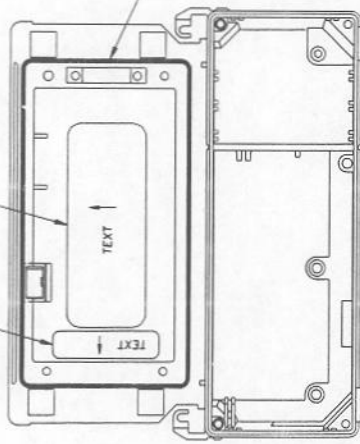
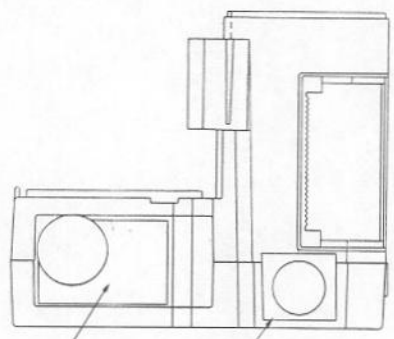
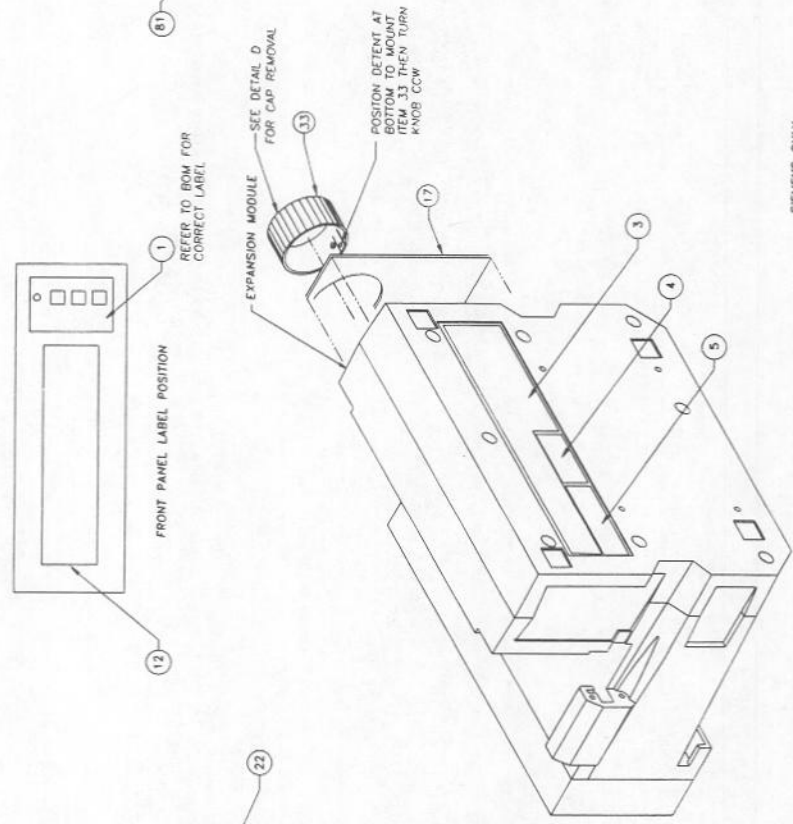
LIST OF MATERIALS

ITEM	DESCRIPTION
138	KEYING PIN
136	TUBING, SHRINK, 1/8, BLK
134	WIRE WRAP
129	SUBASSY, EXPANSION CABLE, EMP/S W/L
128	TIE WRAP, NYLON
127	4-WAY ADHESIVE BACKED CABLE TIE MOUNT
126	CABLE, SPO2 FUSE
124	GASKET, BRACKET
86	BRACKET, BEAD
85	FERRITE BEAD
84	CO2 BOARD
80	CONNECTOR, 20 POS.
78	CABLE, FLEX
77	CONNECTOR, NICOLAY
76	CONN. PANEL - BOTTOM
75	CONN. PANEL - TOP
68	PANEL, REAR CHASSIS, RECORDER
57	SCREW, 4-40X.25", PHL, PHD, SEWS
25	MINISOM BOARD
11	O-RING

ITEM	DESCRIPTION
107	SIEMENS SERIAL LABEL
92	BATTERY LABEL
81	LABEL, CO2 CONN. PANEL
33	"O" LOCK CONNECTOR
22	O-RING
17	SP02 SIDE PANEL LABEL
12	FRONT PANEL FILLER LABEL
5	LABEL
4	REAR LABEL
3	DOOR LABEL
1	REORDER LABEL



FRONT VIEW OF EMP CHASSIS



2B—Main/Interconnect Boards

Detailed Circuit Descriptions

These detailed circuit descriptions are referenced to schematics in subsections of Section 2, *Diagrams*. This subsection of the *Schematics & Drawings Set* contains only Monitor circuit descriptions. For detailed circuit descriptions of each of the three options (Printer, SpO₂, CO₂), see the appropriate options section.

Main Board *Schematics 800-0023-00, 800-0023-01, or 800-0023-02 (Section 2B)*

NOTE

Each set of Main Board schematics contains twelve sheets. The following descriptions identify the sheets covered. Except for sheets 1, 2, 3, and 7, the schematics of 800-0023-00 are identical with like numbered sheets of 800-0023-01. And, except for sheet 2, the schematics of 800-0023-02 are also identical with like numbered sheets of 800-0023-01. Differences are discussed in the appropriate sections for schematic sheets 1, 2, 3, and 7. See Table 6-1 in the Calibration/Maintenance manual for a summary of the different board types.

ECG Circuits

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 2 of 12, Section 2B

Signal Input and Lead Select

Three patient leads, LA, RA, and LL, connect the ECG signal to lead select switches, U200, U201, through circuitry designed to protect the monitor from high voltage defibrillator and electrocautery signals. The patient cable has 1K Ω resistors in series with each lead to limit current to neon bulbs, LP200, LP201, LP202. The neon bulbs turn on at 90 V and limit the high voltage present at the input to the ECG circuitry. Diodes within U200 and U201 clamp the inputs to +VS and -VS to protect the ECG selector switches. Resistors R200, R201, R203, R204, R206, and R207 limit current to U200 and U201 inputs. The resistors and capacitors between the neon bulbs and the selector switches form a low pass RC filter to attenuate RF transients during electrocautery.

The lead selector switches connect to the buffer amplifiers U203D and U203A the two patient leads appropriate for the desired ECG vector. The remaining lead is a driven reference lead from U203B. This common mode reference signal is tapped from the buffers through R213 and R214. This configuration eliminates any common mode component of noise or offset voltage coming from the patient. Following the buffer amplifiers is a X10 differential amplifier, U203C.

Lead Fail

Lead failures are detected using the VLF input to the A-D converter, U1007. If a single signal input lead is removed or open, the input to U203A or U203D is pulled up to +2.5 V through 100 M Ω resistor R210 or R209 respectively. The signal input lead that remains connected is pulled to -2.5 V by U203B. Because R246 and R247 that establish VLF are unequal, the polarity and magnitude of VLF indicate which electrode(s) are unhooked (e.g., if VLF is $\approx +1.2$ V, the + input is open; if VLF is ≈ -1.2 V, the - input is open; and if VLF is $\approx +2.5$ V, either the driven lead or any two leads are open). Once a lead fail is detected, the CPU can determine which lead is open by switching through the lead select positions and measuring the voltage on VLF. Capacitor C225 is for suppressing electro-surgical interference in the VLF signal.

Trace Restore

The ECG signal from U203C goes to the bandpass and trace restore circuit, U204A, U204B and associated components. This circuit auto-centers the baseline and quickly returns the signal to center screen after a lead fail or lead select change. Both U204A and U204B are inverting amplifiers, each within the other's feedback loop. U204A has a dc gain of 8.27 with a high frequency roll-off of about 42 Hz. U204B is an integrator whose capacitor, C216, charges to the average level of the ECG signal and keeps the average output of U204A at a constant level. Because switch U300B is normally off, current available to charge C216 is small. Because the time constant is long, ECG pulses will not change the baseline level. In the 800-0023-00 and 800-0023-02 schematics, R218, R219, Q201, and Q202 prevent high amplitude pacer pulses from significantly distorting the ECG baseline as well. In the 800-0023-01 schematic, U304C, as controlled by a one-shot from the pacer detector serves this function. If the level of VECG at the input to the A-D converter is outside a certain voltage window due to a lead fail or lead select change, the CPU will turn on switch U300B, shorting out R227, shortening the time constant. The short time constant enables C216 to quickly charge to a new average level and restore the baseline and ECG signal to center screen. The switch is turned on for only about 88 ms, then opens to allow normal (i.e., slow) baseline centering. From U204A, the ECG signal is applied to U204C with a passband of ≈ 0.5 to 42 Hz. U204C is a non-inverting amplifier with a gain of 6.11. The net mid-band ECG circuit gain is 500 from the ECG input to the input of the A-D converter.

Pacer Detector

The last stage of the ECG circuit is a pacer detector. Pacer pulses are detected if their slope is fast enough to pass through the high pass filter circuit formed by C223, R248, U204D and R249. This filter circuit will pass pacer pulses, but not QRS signals. U205B and associated components form a low-pass filter, which amplifies the pacer pulses while limiting high-frequency noise. After the pacer signal is conditioned, it goes to window comparator U205A which generates a logic signal to flag the CPU, indicating that a pacer pulse has occurred. Diode D203 is biased so only pacer pulses larger than a certain amplitude will generate the logic signal.

Longer duration pacer pulses may cause two pulses to occur at the output of U205B, one pulse from the rising edge and one from the falling edge. U205A is a full-wave rectifier which converts the two opposite-polarity

input pulses into two single polarity output pulses. The logic signal output from Q200 is two pulses. Shorter duration pacer pulses generally cause just one pulse at the output of U205A and Q200.

The 800-0023-01 and 800-0023-02 schematics have different component values for C223, R229, and C218 than the 800-0023-00 schematic to improve the pacer detector circuit's tolerance to ambient electrical noise. The 800-0023-01 schematic also includes a simple pulse stretcher circuit composed of R298, R299, C299, and Q299 to create an appropriate duration "one-shot" control signal for U304C in the trace restore circuit. During, and briefly after, a pacer pulse, U304C closes to essentially hold constant the voltage stored in C216. This has the effect of keeping pacer pulse energy from disturbing the ECG baseline position.

Invasive Blood Pressure Circuits

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 3 of 12, Section 2B

The main ECB has two separate chopper-stabilized invasive blood pressure channels. Each channel has a bi-polar transducer power supply. Output signals from the transducers are multiplexed through a common amplifier circuit. The invasive pressure input circuits are protected from electrocautery and defibrillator signals by capacitors C325 through C332, resistors R342 through R345, and diodes D322 through D325, D330 and D331. The output circuits are protected by C317, C318, C321, C322, D320, D321, D328 and D329.

The CPU controls the multiplexer U302, which in turn routes the positive and negative input signals of INV1 and INV2 to the common amplifier. Switch U302 will select INV1 when the INVSEL line is low and select INV2 when it is high. A separate output (VPCF) from the common amplifier is a logic signal input to the A-D converter. This signal flags the CPU when a transducer is present. If no transducer is present, R306 and R307 will pull the inputs of U205C and U205D to about +1V. VPCF follows the average output of U205C and U205D, and when this level exceeds +0.5 V, it indicates to the CPU that no pressure transducer is present.

The level of VPCF for both pressure channels is monitored while the transducer excitation is applied, and while the excitation is zero. If VPCF is \approx zero while a channel's excitation (driver output) is zero, a transducer is considered to be connected to that channel. Additionally, if the above condition is met, but VPCF is HI while that same channel's excitation is ON, an inappropriate transducer (namely an HP 1290A type) is considered to be present.

The transducer power supplies are controlled by the logic lines INVPWR1/ and INVPWR2/, which are cycled at 181 Hz by the CPU at an appropriate duty factor (see below).

Transducer driver negative outputs VBL01 and VBL02 are directly sensed by the A-D converter and monitored by the CPU to verify proper negative driver operation and to sense transducer shorts. Transducer driver positive outputs VBHI1 and VBHI2 are not directly monitored. Rather, signals for each channel—which are related to both the positive output voltage and to

each channel's output current—are multiplexed by U302, sensed by the A-D converter and then monitored by the CPU. From these signals, the CPU can not only verify proper positive driver operation and detect transducer shorts, it can also determine the dc load resistance of the transducer and set driver duty factor accordingly.

Having two possible driver duty factors, based on load impedance, provides a good compromise between power consumption and the unique drive requirements of an HP 1290C option J06 quartz transducer for monitors with the HP side panel option. This transducer contains active circuitry which, when used with pulsed dc excitation, basically cannot be left without power for more than ≈ 0.5 ms. Its dc resistance mimics an ≈ 1.1 k Ω resistor when the transducer is excited by 5 V. By providing an excitation duty factor of $\approx 91\%$ only for transducer impedances of >900 Ω , the HP 1290C power input requirement is met, and chopper stabilization can still occur, since the excitation is still pulsed. For transducer impedances lower than ≈ 900 Ω , the excitation duty factor is $\approx 11\%$, thus minimizing power consumption.

NOTE

The HP1290C Option J01 (i.e., with a 6-pin connector) transducer has a fixed 511 Ω resistor in its plug wired in parallel with the transducer's load impedance. Consequently, the Propaq will see its impedance as <900 Ω and provide excitation at the lower duty factor. The HP1290C Option J06 (i.e., with a 12 pin connector) transducer has in its plug the 511 Ω resistor in series with a 0.47 μ F capacitor, which series combination is then in parallel with the transducer's load impedance. Hence, the dc impedance will be high enough to cause the Propaq to provide excitation at the higher duty factor. The Option J01 may work acceptably, but its output might be very erratic and noisy instead.

The invasive input signals are multiplexed into an instrumentation amplifier, beginning with non-inverting buffers, U205C and U205D. Their gain and hi pass frequency response are controlled by R319, R320, R321, RP301 and C310. The buffer stage has a gain of 9.26 at the multiplex frequency and unity gain at dc. This attenuates any dc or low frequency drift while passing the IBP samples. Potentiometer RP301 adjusts the gain of the buffer stage to calibrate the IBP amplifier.

After passing through the buffer stage, the differential signal is amplified by U303A. This stage has a gain of 21.05. The switch U300A, which is controlled by the CPU through logic line INVCAP, controls the charge on C304 in order to cancel any dc offset from the IBP signal. In operation, U300A grounds the output end of C304 while U302 is set to a channel whose excitation is off. During this interval, C304 is charged with any offset voltage errors. Next, U300A is opened and excitation applied to the selected transducer. The voltage change at the output end of C304 is then proportional to the sum of the measured pressure and that transducer's residual offset. (The latter is subtracted off by software after the transducer is zeroed.) The line VINV is the IBP input to the A-D converter.

NOTE

U304C, shown as an unused analog switch in the 800-0023-00 and 800-0023-02 schematics, is missing from this sheet on the 800-0023-01 schematic. U304C in the 800-0023-01 schematic is used on sheet 2 instead.

Non-Invasive Blood Pressure Circuits (CUFF)

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 4 of 12, Section 2B

The NIBP circuit consists of a transducer bi-polar power supply, a dc-coupled amplifier to condition the pressure being measured, and an ac-coupled amplifier to condition the oscillometric signal.

NIBP Transducer Driver

The bi-polar supply for the transducer is always on, despite having switch U304B. The latter may be utilized in the future, but at the time of this writing, U304B is always left open.

Pressure Amplifier

The differential pressure signal from the transducer is amplified by U402C and U401D. (U402D buffers the + transducer output, so that the transducer is not loaded by the low input impedance of the minus input of U402C.) The output of U401D is a dc signal (VPRS) to the input of the A-D converter. This signal corresponds to the pressure in the blood pressure cuff. Potentiometers RP400 and RP401 respectively adjust the gain and zero the pressure measurement circuit. Software automatically tracks and compensates for small offset drifts in VPRS.

Oscillometric Amplifier

The oscillometric component of the pressure signal, which occurs at the pulse rate, is ac coupled to the amplifier U402B. Only the changing portion of the NIBP signal is amplified by this stage. Between measurements, and when pressure in the cuff is bleeding to the next value, switches U300C and U300D are closed to keep the bleed step from appearing in the VOSC output. The CPU controls the switches by the logic line OSCSW. Amplifying stage U402A provides gain, high frequency noise attenuation and a baseline offset adjustment, RP402. Components R415 and C405 form an additional low pass filter at the input to the final amplifier stage, U401C. Software automatically tracks and compensates for small offset drifts in VOSC.

Temperature Circuits

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 5 of 12, Section 2B

The temperature circuit has inputs for three types of temperature probes. The resistance of all three temperature probe types decreases with increasing temperature. This resistance is in parallel with part of a voltage divider network. The three voltage dividers are multiplexed through U501 and a common amplifier, U303B. The output of U303B is applied to the input of

the A-D converter. A reference voltage divider, R516, R517, and R518 is also multiplexed through U501 and U303B. Software periodically checks the tap points in the latter divider to determine and cancel any offset and gain errors in the U303B stage. Since all four voltage dividers use the same reference supply (+VR), any voltage drift in the reference supply will appear on the reference divider. Using a common reference supply and amplifier compensates for changes in amplifier gain or reference voltage drift. D501, D502, D503, C502, C504, C506 protect the temperature inputs from electrocautery and defibrillator signals, and electro-static discharge during plug-in or removal of the temperature probe.

The junction between R519 and R507 in the YSI700 (ring contact) divider yields an output voltage that is still within the A/D converter's dynamic range for YSI700 probes that are hotter than the Propaq's 50 °C upper spec limit, so that there is a clear distinction between a hotter than spec YSI700 probe and a YSI400 probe that grounds the "ring" jack contact.

A 5th voltage divider string—R520 through R523—is sampled under software control to test the accuracy of the multiplexed temperature channel. If the A/D readings seen when digitizing voltages from this 5th divider string do not agree with those predicted by divider string R516 through R518, the software puts up a temperature channel error message and disables the channel from further use.

The Electromedics Temperature Probes use the mini-phone jack and the YSI 400 and YSI 700 probes share the 1/4" phone jack. The YSI 400 probe makes contact with the tip connector of the jack. The YSI 700 probe touches both the tip and the ring. Except for fault testing, the CPU ignores the tip portion of a YSI 700 probe when the ring is making contact.

Isolated CPU (ISO CPU)

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 6 of 12, Section 2B

The Isolated CPU, U1000, uses crystal X1000 to generate its own reference clock. The low address byte latch, U1002, latches and holds the low address byte while the high address byte simultaneously appears at Port P2.X. Depending on the previous program instruction, the data bus will transfer a data byte to or from the CPU at Port P0.X following the low address byte. Prom U1003 is the program memory, and U1004 is the RAM for the data memory. No address decoder is required in this circuit. U1004 is selected when line A15 is high. When A15 is low, U1004 is disabled. U1003's output is enabled only by PSEN\ (which occurs only during ROM fetches). Latch U1006 is used to control various circuits in ECG, temperature, IBP and CUFF channels. Microprocessor U1000 controls the ECG lead selection from Port P1.4 and P1.5. The ± 2.5 V levels on these lines are shifted to -2.5 V or $+5.7$ V levels by Q1000 and Q1001 as required by the ECG lead select multiplexers.

The P3.4 output of U1000 is used to select the A-D converter for data transfer. Outputs P1.0, P1.1, and P1.2 are the three data lines used to select the desired analog input and read the A-D converter. (Serial data is simultaneously written to and read from the A-D converter as clocked by P1.0.)

Voltage followers U303C and U303D and diode networks U1008 and U1009 clamp the inputs to the A-D converter, U1007. Clamping begins at ± 2.5 V, and hard limits at $\approx \pm 2.8$ V. The output of U1007 will be incorrect if the inputs are within ± 2.8 V.

The ECG data from the A-D converter (U1007) is analyzed by a software routine that detects the QRS portion of the ECG signal. The software routine is designed to recognize the difference between the QRS complex and T-waves, pacemaker signals, and noise. A trigger signal is generated by P1.7 of U1000 when a QRS complex is detected by microprocessor U1000. This signal is coupled across the isolation barrier through optocoupler U606 and is available as the QRS sync signal on the analog output jack.

Display CPU

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 7 of 12, Section 2B

Clock Generator

U700 provides two clock frequencies, 10.752 MHz and 18.432 MHz. The 10.752 MHz clock is used by the Display Control Processor U704 and is also divided down by U703 to provide 2.625 kHz TONE signal for the speaker and 42 kHz clock for U704. The 10.752 MHz clock is also used for the display clock signal (DISPCLK) for monitors with LCD displays. The 18.432 MHz clock is used by the UART U714, and for the display clock (DISPCLK) when the monitor has an EL display.

The display clock frequency is fixed at 18.432 MHz for the 800-0023-00 and 800-0023-02 schematics (all instruments with this board type are used only in EL display monitors). The display clock frequency must be manually set via JP701 in instruments whose main boards correspond to the 800-0023-01 schematic. In instruments with EL displays, P11 pin 2 will be pulled low (by the display's cable) and U704 will know by reading UART U714 pin 11 whether to format display data for an EL or LCD display.

Display CPU

U704 can address 64K of ROM and another 64K of RAM. Port P0.X is the lower byte of address and Port P2.X is the higher address byte. Port 0's lines are multiplexed between the lower address byte and data. Port P1.X is used to read the panel key switches and battery level measurement, and to send out the clock to the watchdog timer and the signal for main power supply shut down.

NOTE

By generating a shutdown pulse (which also goes to the recharger board) that is too short to stop the supply, but long enough to trip a pulse receiver circuit on the recharger board, the display CPU can trip the second air valve when the CPU is unable to empty the NIBP cuff via the primary air valve.

Port P3.X is used for internal timing and interrupt control, read and write strobes for peripherals, serial transmit and receive communications with the isolated CPU, and with auxiliary Propaq options like SpO₂ and printer.

Address Latch and Decoder

The address latch, U705 latches and holds the low address byte while the high address byte simultaneously appears at Port P2.X. Depending on the previous program instruction, the data bus will transfer a data byte to or from the CPU following the low address byte. Once the high address is present, the address decoder, U712 will decode and select the proper memory chip or peripheral chip.

Program and Data Memory

The 8031 display CPU can access two separate 64 kilobyte memory spaces. Both memory spaces use the same data and address bus. The program memory (PROM U706) uses the CPU signal, PSEN, as the read strobe. The program memory has 128 kilobytes, divided into upper and lower halves by bank switch control line BANKSEL 0. (BANKSEL 1 provides for future expansion of U706 to a 256 kilobyte size.) The data memory space (RAM, UART, display controller, analog output DAC, and real-time clock) uses the RD and WR strobes to control the read/write functions. The chip select decoder, U712, selects the chip.

U716, a 32 kilobyte RAM, is the data memory. U716 has a battery back-up power supply. Since they always retain data, U716 and the clock/calendar chip (U805 on schematic sheet 8), must be protected against glitches on the RD and WR lines during reset, power up and power down. This is accomplished by battery backup supervisor chip U717 protecting U716, and by logic signal CS1PRO which keeps U805 disabled for about 3 seconds when the monitor powers up or down.

C798, a 0.1 μ F capacitor from U717 pin 4 to ground improves proper operation of U717 during ESD discharges.

Serial Communications (UART)

UART U714 converts parallel data to serial data and communicates with RS-423 transmitters and receivers U1101, U1102, and U1103. See Sheet 10 discussion below about RS-423 transmitters and receivers.

Miscellaneous I/O pins handle backlight on/off for LCD displays, pump on/off, EEPROM data-out, defib marker signal and auxiliary reset, as controlled via U704.

Display Controller

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 8 of 12, Section 2B

Display Controller

U800 is a special microprocessor used to control the display. U800 can receive and send data to the DISPLAY CPU (U704). U801 is the display RAM and holds the data for the display. Data in the display RAM is updated constantly by U800. U800 provides all the necessary clock and data signals to operate the LCD and EL displays. U800 uses both D1 and D2 outputs for LCD displays, but only D1 for EL displays. U807B divides the DISPCLK signal by 8 before it is sent to U800.

Clock/Calendar

U805 is a real time clock/calendar controlled by CPU (U704). Crystal X800 is the reference time base for the clock/calendar. The CPU polls the clock/calendar chip once per second to obtain the current time and date. The logic signal, CSIPRO, is used to protect U805 data from startup and shutdown glitches. U805 operates in a special low power state ("sleep mode") to maintain the current time while the Propaq is off.

Control Bit Latch Circuits

U803 is an 8-bit latch used to control a number of output circuits.

- Q1 output increments U807A which controls the LCD screen contrast (i.e., viewing angle). U807A is reset at power-up to initialize the contrast setting. This function is not used in monitors with EL displays.
- Q2 output is BANKSEL 0 for bank switching of ROM U706.
- Q3 output, in conjunction with Q8 output, selects speaker volume.
- Q4 output is BANKSEL 1 for bank switching of ROM U706.
- Q5 output controls the primary valve logic line.
- Q6 output controls the red alarm LED and EEPROM serial clock.
- Q7 output controls the amber alarm LED and EEPROM serial data input.
- Q8 output, in conjunction with Q3 output, selects speaker volume.

Monitor Configuration Storage

EEPROM U810 is programmed at the factory to indicate to the CPU which features and options are enabled, which language is selected, and the instrument serial number.

Analog Outputs

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 9 of 12, Section 2B

D-A Converter

U900 is a dual D-A converter that is used for three different functions. The lines DACA_P and DACA_S are ECG analog outputs from the monitor. DACA_P has a gain of 250 mV/mV as referred to the ECG input and DACA_S has a gain of 1000 mV/mV. The line DACB is an additional analog output for P1 that doubles as a successive approximation A-D conversion of the battery voltage. Once every 15 seconds, under software control, the DACB output provides an analog voltage that is equivalent to the last measurement of the battery voltage. This output is scaled down to be of the same proportion as the voltage on pin 2 of U902A. U902A compares its pin-3 voltage with a scaled down battery voltage and sends the logic signal BATLEV to the CPU. Depending on the value of BATLEV, the CPU will increment, decrement, or hold the count it feeds temporarily to U900 to compare with the present battery voltage value. This brief comparison is fast enough that R906 and C904 filter most of it out of the DACB output signal.

Signal LOVSW/ drops rapidly when the user turns off the monitor's power switch, giving the display control processor time to initiate an orderly shutdown process before its VCC supply voltage drops too low to operate properly.

Speaker Driver

The Speaker Driver circuit, made up of Q910, Q911, Q912, Q913, and U720C, provides 3 levels of speaker output. The 2.6 kHz TONE signal enters Q910 and passes through Q911, R933, and R932 at low level, Q912 and R932 at medium level, or Q913 only at high level as selected by SPEAKER_A and SPEAKER_B signals and gate U720C. Signal CS1PRO prevents the speaker from sounding during instrument power-up.

Interface

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 10 of 12, Section 2B

RS423 Transmitters and Receivers

Serial communication between the monitor and a peripheral device is accomplished by U714, U1101, U1102, and U1103. Parallel data from the CPU is sent to the UART, U714, on the data bus. The data is sent to U1101 in serial form. Handshake signal RTS/ (ready to send) is always sent as a true condition to U1101 which is in turn transmitted to the serial device. The peripheral device sends a handshake, CTS (clear to send) back through U1102 to U714 when it is ready to receive data. When U714 receives a full byte of data through U1103 from the peripheral device, it will send an interrupt signal to the CPU telling it to retrieve the data.

QRS Sync Output Circuits

The Propaq provides a digital output pulse when its software algorithms detect a QRS signal. (The delay is about 30 msec from the peak of the QRS to the leading edge of this pulse.) U708E and U708F provide a 5 V, normally low, pulse to the outside world (if connector P10 has pins 1 and 2 jumpered together), and to the Baq Paq for the C-LOCK function of SpO₂. Q1103, Q1104, Q1106, U1101C and the associated circuitry provide a 15 V, normally low, pulse to the outside world if connector P10 has pins 2 and 3 jumpered together. Except for instruments built for Siemens, all Propaqs are configured for a 5 V output pulse. Pulse duration is set by software at 100 ms.

Power Supply

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 11 of 12, Section 2B

Power Regulator

The main power supply for the monitor operates from the battery supply, +VSW, and uses U602 as the switching regulator. When the main power switch is turned on, C609, being initially discharged, will turn on Q603. This connects the supply +VSW to U602, pin 5 and starts the regulator. The output of the regulator is a square wave, which is applied to primary

winding pins 11 and 12 of T601. The VCC supply output is fed through voltage divider, R614 and R613 to pin 2 of U602 to achieve a regulated +5 V at TP600. The +5 V supply VCC is regulated by the duty cycle output of U602. When the supplies are operating, the +4 V output on C614 is fed back to U602 pin 5. By this time, C609 has charged, turning off transistor Q603. The +4 V supply will then continue to provide the voltage to pin 5 of the regulator to keep it operating. U602 has internal current limiting of its output at pin 4 to protect U602 from supply shorts, etc.

Soft-Start Circuit

The regulator has a "soft start" circuit. When the regulator is first turned on, C610 begins to slowly charge. This in turn, controls the voltage on U602 pin 1 which creates the "soft start".

Power Supply Shutdown

To prevent destroying programmed data stored in the clock/calendar chip and U716 RAM during a power shutdown, the shutdown must be accomplished in a controlled manner. The Vcc supply voltage must drop smoothly to <1 V and not try to restart itself. To that end, when the display CPU, U704, receives data that indicates battery voltage is low, or that the power switch has been turned off, U704 starts the shutdown by sending a low logic level on the SHUTDOWN/ line, turning on Q607. Two things occur when Q607 turns on. First, transistor Q606 turns on and pulls U602 pin 1, to GND. This turns off the regulator, shutting down the power supply. Second, transistor Q609 turns on and discharges C614, taking away the power input to the regulator U602, pin 5 to ensure that the regulator does not restart. The time-constants of the R-C networks containing C623 and C608 also prevent the regulator from restarting.

(See also the note about short duration power supply shutdown pulses in the display control processor section for schematic sheet 7.)

Isolated Supplies

The isolated secondaries, $\pm V_B$ and $\pm V_S$ are the high current, unregulated supplies for the isolated circuitry. U603 is a regulator whose output is determined by the ratio of R611 and the parallel combination of R669 and R612. U603 pin 7 is internally compared to a +1.235 V reference and adjusts the output on U603 pin 1 accordingly. U604C and Q610 supply +VD to the digital circuits and +VDA to the analog circuits. U604A is an inverting amplifier with a gain of one to supply Voltage -VR that tracks +VR. U604B and Q612 supply -VD to the digital circuits and -VDA to the analog circuits. D616, D615 and D614 protect the circuits against reverse polarity, in case of a failure of their respective power supplies. Zeners D204 and D205 provide clamping of the $\pm V_S$ supplies for transients from ESD or defibrillator pulses.

The magnitudes of $\pm V_D$ and $\pm V_{DA}$ are about 0.2 V greater than the magnitudes of $\pm V_R$ so that the clamp circuits at the input of A-D converter, U1007, can function satisfactorily. This voltage difference permits inputs in the range of ± 2.5 V to be unrestricted, yet prevents inputs from exceeding the supply voltages of the converter. EMI Null Adjust, RP601, permits nulling the switching frequency noise that would otherwise be developed across T601's isolation barrier.

Spark gap SG600 provides a consistent location where high-voltage arcs may jump across the isolation barrier during ESD, etc.

Opto-Couplers

Schematic 800-0023-00, 800-0023-01, or 800-0023-02, Sheet 12 of 12, Section 2B

Opto-couplers are used to bridge the patient safety barrier and provide communication between the Data Acquisition and Display CPU's. The opto-couplers are also used by either CPU to reset the other CPU. The transmit and receive lines are at a high level most of the time during normal communication. Capacitors C700 (sheet 7) and C1000 (sheet 6) charge to this high level through R604 and R606, respectively. The voltages on C700 and C1000 are inverted through U708A and U1010A to provide the RESET signals to the DISPLAY and ISO CPU's. An inverter (with Schmidt Trigger input hysteresis) is used to provide the correct polarity reset pulse to the CPU. If one CPU must be reset by the other, it will drop and hold the transmit line low. When that happens, the opto-coupler will couple a low through R604 or R606 to discharge C700 or C1000. As the capacitors discharge, the reset line at the input to the CPU will go high and stay high until the transmitting CPU pulls its transmit line high.

U606 couples the QRS sync pulse across the isolation barrier.

Display Interconnect Board

Schematic 800-0015-00, Sheet 1 of 1, Section 2B

The Display Interconnect/Shield/Crowbar board is used only in Propaq monitors with EL displays. It serves as a means of handling the interconnections among the Main board (either schematic version), Recharger board (EL version), and the EL display module. In conjunction with the conductively-coated display filter, it provides EMI shielding of the EL display module, and provides the last stage of power supply decoupling for the EL display module. By grounding P4 pin 2, it tells the Main board to format the display pixel data for an EL display. Finally, it protects the EL display module from being permanently damaged should ICs in that module latch up (i.e., crowbar) and draw excessive current from Vcc following an ESD discharge near the display. (The display's column drivers are particularly sensitive to ESD.)

At power up, U2A may come up in a "reset" condition. If it does, Q3 will be turned on, thus passing Vcc to the display, U1 will pass the Main board's 4 control signals through to the display, and the display will operate normally. If U2A comes up in a "set" condition instead, the display will not receive power for 1.5 seconds, but will then come on automatically, just as if an over-current condition had shut it down as described below.

Vcc Supply current for the EL display module passes through R1 and R2, and provides some amount of forward bias to Q1. Since the lower end of R5 is grounded through Q2 while the display is on, divider R3/R5 also contributes forward bias to Q1. In normal display operation, the total base-emitter voltage on Q1 is insufficient to turn on Q1.

If an IC in the EL display module were to latch up during ESD, the supply current through R1 and R2 would increase dramatically, except that Q1

turns on when that current reaches ≈ 70 mA. Q1 turning on sets U2A, which turns Q3 (and the display) off, and turns Q4 on to ensure that the display's Vcc goes to almost zero volts. With display current gone, Q1 shuts off, removing the "set" to U2A. U2A's Q/ output goes LO, quickly forcing all outputs of U1 LO. The circuits will stay in this condition while C17 slowly charges.

When the voltage across C17 increases enough that Q2 turns off (in about 1.5 seconds after shutdown), R5 can then reset U2A. U2A's Q output then goes LO, turning Q3 and the display back on. C4 filters out the display's turn-on current surge so that the surge will not turn on Q1. U2A's Q/ output meanwhile goes HI, quickly discharging C17, turning on Q2, and hence removing the reset to U2A. Once R8 charges C1 back up to a high enough level, U1 will again pass control signals through to the display.

Since all the display data is updated and stored on the Main board, the visual appearance of the above sequence of events is that the EL display goes black for 1.5 seconds, then comes back, just as it should be at that time. No new data or screen formatting is lost.

The high voltage supplies stay on throughout the above process.

Bill of Materials—Main/Interconnect Boards

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
1	650-0027-00	TAPE, ACRYLIC FOAM, DOUBLE COATED, .090"
	030-0018-00	PCB, MAIN
	650-0026-00	TAPE, KAPTON INSULATING
	800-0023-00	SCHEMATIC, MAIN PCB, MULTI-LANGUAGE
	824-0197-00	ASSY DWG, MULTILANGUAGE, MAIN PCB, FIRST LEVEL
C100	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C101	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C200	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C201	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C202	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C203	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C204	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C205	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C206	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C207	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C208	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C209	261-0023-00	CAP, SMD, CER, 4700PF, 5%, 50V, X7R, 1206
C210	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C213	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C214	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C216	265-0001-00	CAP, RADIAL LEAD, POLYSTYRENE, 1.0UF, 5%, 63V
C218	261-0018-00	CAP, SMD, CER, 390PF, +/-10%, 50V, NPO, 1206
C219	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C220	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C221	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C223	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C225	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C226	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C304	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C308	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C309	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C310	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C311	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C312	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C314	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C315	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C316	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C317	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C318	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C319	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
C320	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C321	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C322	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C323	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C324	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C325	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C326	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C327	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C328	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C329	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C330	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C331	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C332	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C400	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C401	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C402	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C404	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C405	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C407	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C409	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C414	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C416	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C420	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C422	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C423	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C502	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C504	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C506	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C509	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C512	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C513	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C601	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C602	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C603	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C604	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C606	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C607	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C608	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C609	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C610	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C611	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C612	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
C613	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C614	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C615	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C617	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C620	261-0022-00	CAP,SMD,CER,.33UF,5%,50V,X7R,1812
C621	250-0024-00	CAP,330UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C623	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C624	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C625	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C626	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C632	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C633	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C634	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C635	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C636	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C637	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C638	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C645	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C646	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C647	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C680	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C681	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C700	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C701	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C702	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C703	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C704	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C705	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C706	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C709	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C715	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C716	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C717	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C719	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C720	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C721	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C725	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C726	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C750	260-0009-00	CAP,CER,450PF,20%,50V,14 PIN DIP SIZE
C799	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C800	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C802	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
C803	268-0001-00	CAPACITOR, SURFACE MOUNT, VARIABLE, 5-30PF, 25V
C805	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C806	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C807	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C808	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C813	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C814	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C815	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C819	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C820	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C825	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C850	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C851	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C900	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C903	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C904	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C906	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C930	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C950	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C951	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C952	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C953	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C999	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C1000	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C1001	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1002	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1003	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1004	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1005	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1006	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1007	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1008	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1009	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1010	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1011	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1101	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C1102	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1103	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1104	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1105	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1107	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1108	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
C1109	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1150	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1151	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1153	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1154	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
D100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D102	308-0013-10	DIODE,ZENER,16V,5%,225MW
D203	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D204	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D205	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D210	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D211	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D212	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D300	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D320	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D321	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D322	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D323	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D324	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D325	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D326	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D328	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D329	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D330	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D331	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D501	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D502	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D503	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D601	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D602	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D603	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D604	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D605	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D607	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D608	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D609	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D613	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D614	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D615	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D616	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D618	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
D619	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D625	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D700	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D701	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D702	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D801	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D802	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D903	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D905	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D906	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1000	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1002	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1102	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1103	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1104	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1105	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1111	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1112	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1113	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1114	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1115	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1116	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
D1117	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1150	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M501, SOT-23 PACKAGE
JP610	503-0044-00	SHUTN, 2.5 AMP, BLACK, 94V-O
L601	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L602	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L603	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L604	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
LP200	500-0001-00	LAMP, NEON, A1C
LP201	500-0001-00	LAMP, NEON, A1C
LP202	500-0001-00	LAMP, NEON, A1C
P1	610-0013-00	HEADER, 8 PIN, .100
P2	610-0123-00	CONNECTOR, CONTACT SOCKETS
P3	610-0012-00	HEADER, 7 PIN
P4	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P5	610-0011-00	HEADER, 6 PIN
P6	610-0011-00	HEADER, 6 PIN
P7	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P8	610-0010-00	HEADER, 5 PIN, .100

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
P9	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P10	610-0143-00	HEADER, 3 PIN
P11	610-0123-00	CONNECTOR, CONTACT SOCKETS
Q200	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q201	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q202	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q300	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q301	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q302	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q303	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q304	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q305	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q603	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q605	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q606	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q607	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q609	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q610	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q612	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q680	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q681	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q702	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q803	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q804	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q806	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q807	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q904	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q905	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q910	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q911	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q912	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q913	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1000	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1001	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1103	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q1104	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1106	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1150	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1151	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1152	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1153	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
R200	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R201	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R202	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R203	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R204	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R205	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R206	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R207	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R208	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R209	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R210	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R212	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R213	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R214	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R215	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R216	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R217	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R218	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R219	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R220	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R221	201-0000-00	RES,SMD,0 OHM,1206
R222	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R223	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R224	201-0000-00	RES,SMD,0 OHM,1206
R225	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R226	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R227	206-3324-01	RES,3.32M,1%,.25W,MF,AXIAL LEAD
R229	201-1782-00	RES,SMD,17.8K,1%,1206,+/-100 PPM/DEGREE C
R231	201-1543-00	RES,SMD,154K,1%,1206
R232	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R233	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R234	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R235	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R236	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R237	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R238	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R239	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R240	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R241	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R242	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R243	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R244	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R246	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R247	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R248	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R249	201-1543-00	RES,SMD,154K,1%,1206
R250	201-3741-00	RES,SMD,3.74K,1%,0.125W,1206,100 PPM/DEG C
R253	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R260	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R261	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R300	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R303	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R306	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R307	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R310	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R311	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R312	202-0001-00	RESISTOR,100K OHM,0.1%
R313	202-0001-00	RESISTOR,100K OHM,0.1%
R314	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R315	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R316	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R317	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R318	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R319	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R320	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R321	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R323	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R330	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R331	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R333	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R334	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R335	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R336	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R337	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R338	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R339	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R340	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R341	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R342	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R343	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R344	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R345	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R346	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R347	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R350	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R351	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R352	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R353	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R354	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R408	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R409	201-8453-00	RES,SMD,845K,1%,.125W,1206,TC 100PPM/C
R410	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R411	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R412	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R413	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R415	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R418	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R420	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R421	201-1333-00	RES,SMD,133K,1%,.125W,1206,100PPM/DEG C
R424	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R430	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R431	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R435	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R438	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R439	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R442	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R443	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R444	201-4993-00	RES,SMD,499K,1%,.125W,1206
R445	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R446	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R451	201-5903-00	RES,SMD,590K,1%,.125W,1206,100PPM/DEG C
R452	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R453	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R454	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R455	201-7503-00	RES,SMD,750K,1%,.125W,1206
R456	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R501	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R502	201-5231-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 5.23K 1%
R503	205-0017-00	RESISTOR,5.23K OHM,.02%,.1W
R504	205-0018-00	RESISTOR,1.5K OHM,.02%,.1W
R507	205-0027-00	RES,70.0K,.02%,.1W,T10,AXIAL
R508	205-0028-00	RES,22.1K,0.02%,T10,.10W,AXIAL LEAD
R511	205-0019-00	RESISTOR,24.0K OHM,.02%,.1W
R512	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R515	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R516	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R517	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R518	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R519	202-5001-00	RES.SMD,5.00K,0.1%,.125W,1206,T9
R520	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R521	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W
R522	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R523	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R602	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R604	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R606	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R607	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R608	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R610	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R611	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R612	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R613	209-3321-00	RES,SMD,3.32K,0.5%,1206,+/-25PPM/DEGREE C
R614	209-1002-00	RES,SMD,1206,10.0K,.5%,+/-25PPM/DEG C
R615	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R616	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R618	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R619	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R620	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R621	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R622	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R623	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R624	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R626	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R627	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R628	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R629	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R630	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R633	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R635	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R639	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R641	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R650	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R660	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R661	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R662	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R663	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R664	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R667	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R668	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R669	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R680	201-1691-00	RESISTOR,SMD,1.69K,1%,0.125W,1206
R681	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R682	201-1501-00	RESISTOR,SMD,1.50K,1%,.125,1206
R683	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R704	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R709	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R710	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R711	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R712	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R714	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R716	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R720	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R801	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R802	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R803	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R804	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R805	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R806	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R808	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R809	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R810	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R812	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R813	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R814	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R815	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R818	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R819	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R820	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R824	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R825	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R826	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R827	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R840	201-0000-00	RES,SMD,0 OHM,1206
R843	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R902	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R903	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R904	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R905	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R906	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R907	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R908	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R918	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R919	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R920	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R926	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R927	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R928	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R929	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R930	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R931	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R932	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R933	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R934	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R935	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R936	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R937	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R938	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R939	201-1000-00	RES,SMD,100 OHM,1206,1%
R940	201-1000-00	RES,SMD,100 OHM,1206,1%
R1002	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1003	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1005	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1008	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1009	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1012	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1013	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1021	201-0000-00	RES,SMD,0 OHM,1206
R1101	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1102	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1103	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1105	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1106	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1107	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1108	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1109	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1110	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1114	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1115	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1116	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1130	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R1131	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1132	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R1133	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
R1134	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R1150	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1151	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R1152	201-1272-00	RES,SMD,12.7K,1.0%
R1153	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1154	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1155	201-1272-00	RES,SMD,12.7K,1.0%
R1156	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R1157	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
RP301	228-0001-00	RESISTOR, VARIABLE, SURFACE MOUNT, 2K +/-25% .2W
RP400	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP401	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP402	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP601	225-0004-00	RES,POT,3/8" SINGLE TURN,2K OHM,.5W,10%
T601	360-0008-00	TRANSFORMER,SWITCHING, EL MAIN PCB
TP400	503-0022-00	TEST TERMINAL
TP402	503-0022-00	TEST TERMINAL
TP601	503-0022-00	TEST TERMINAL
TP606	503-0022-00	TEST TERMINAL
TP610	503-0022-00	TEST TERMINAL
TP622	503-0022-00	TEST TERMINAL
TP700	503-0022-00	TEST TERMINAL
TP701	503-0022-00	TEST TERMINAL
TP800	503-0022-00	TEST TERMINAL
TP1000	503-0022-00	TEST TERMINAL
TP1001	503-0022-00	TEST TERMINAL
U200	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U201	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U203	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U204	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U205	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U300	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U301	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U302	482-4053-03	IC, SMT, 4053B TRIPLE 2 CHANNEL ANALOG MULTI/DEMULTIPLEXER
U303	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U304	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U401	470-0001-03	IC, OP-AMP,TLC27L4, QUAD CMOS, LOW POWER
U402	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U501	482-4051-03	4051 ANALOG MULTIPLEXER, SINGLE 8 CHANNEL
U602	474-0002-04	IC, TO220 PKG, SWITCHING REG,LT1070, 5A HIGH EFF
U603	472-0001-03	IC, SMT, VOLTAGE REG,LP2951,ADJUSTABLE MICROPOWER
U604	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
U605	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U606	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U607	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U608	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U700	502-0009-00	OSCILLATOR,DUAL,CRYSTAL,CLOCK,18.432MHZ/10.75
U703	400-4040-03	COUNTER, 12 BIT BINARY ASYNCHRONOUS
U704	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U705	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U706	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
U708	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U712	400-0138-03	IC,SMT,74HC138,3 TO 8 LINE DECODER,SOIC16
U714	441-0002-02	IC, SMT, 82050, ASYNCHRONOUS COMMUNICATIONS CONTROLLER, PLCC
U716	430-0005-03	IC,SMD,256K BIT SRAM,LOW STANDBY CURRENT
U717	441-0005-03	IC,SMD,DS1210,NONVOLATILE CONTROLLER CHIP
U720	400-0011-03	IC,SMD,74HC11,TRIPLE 3 INPUT POSITIVE & GATE
U800	441-0001-03	IC, SMT, 61830B, DISPLAY CONTROLLER, DOT MATRIX LCD GRAPHIC
U801	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U803	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U804	400-0123-03	IC, SMT, 74HC123A, DUAL TRIGGERABLE MONOSTABLE MULTIVIB, SOIC16
U805	442-0001-03	IC, SMT, MSM6242, DIRECT BUS CONNECTED REAL TIME CLOCK, SOIC
U806	400-0000-03	IC, SMT, 74HC00, QUAD 2-INPUT POSITIVE NAND GATE, S014 PKG
U807	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U810	433-0180-03	EEPROM,93C46,1024 BIT,8 PIN,SOIC
U811	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U900	480-0001-02	IC, SMT, AD7528, DAC, CMOS DUAL 8BIT BUFFERED MULT
U902	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U903	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U906	470-0015-03	IC,SMD,OP-AMP,TL031,LOW POWER/LOW OFFSET
U1000	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U1002	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U1003	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
U1004	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U1006	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U1007	481-0001-02	IC,A TO D,TLC1541,10 BIT SERIAL CONTROL AND ELEVEN INPUTS, PLCC
U1008	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1009	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1010	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U1101	442-0005-03	IC,SMD,LT1032,QUAD LOW POWER LINE DRIVER
U1102	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCEIVER
U1103	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCEIVER

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-00		
Reference Designator	Part Number	Description
U1104	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
X800	502-0004-00	CRYSTAL, SMD, 32.768KHZ
X1000	502-0005-00	CRYSTAL,SMD,10.752,MHZ
CY Drawing Designator (Dwg. #824-0211-00), EL Main Brd 2nd Lvl Assy. 032-0007-00		
1	600-0071-00	EMI SHIELD #1 MAIN ECB
2	600-0072-00	EMI SHIELD #2 MAIN ECB,, 1.0000
4	620-0016-00	BUSHING,SHOULDER,NYLON,#4,.115ID,.145OD,.250L
5	620-0041-00	SCREW, SS, 4-40X1/2", PANHEAD, PHILLIPS
6	620-0054-00	KEPNUT,4-40 TH,ZINC,CLEAR CHROMATE
8	620-0159-00	RIVET,.118-.169 CLAMP THICKNESS,PLASTIC,BLACK
9	620-0160-00	WASHER,.120 ID,.187OD,.06 THICK,WHITE
10	620-0163-00	WASHER,SHLDR,0.114-ID,0.135-OD,NYLON
11	031-0018-00	SUBASSY,MAIN PCB,MULTILANGUAGE
13	650-0026-00	TAPE,KAPTON INSULATING
14	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
16	620-0174-00	SPACER,SELF-RETAINING,.25 LONG,NYLON
17	504-0041-00	WIRE, SOLID, 24 AWG, UNINSULATED
18	600-0239-00	NOMEX,410,.010 THICK
	824-0211-00	ASSY DWG,M/L MAIN PCB,2ND LEVEL
BH800	610-0007-00	BATTERY HOLDER, 20MM LITHIUM BATTERY
BT800	501-0002-00	BATTERY, LITHIUM, 3.0V 180mAh BR2032
C798	260-0002-00	CAPACITOR, CERAMIC, .1MFD, 50V, +/-20%, RADIAL LEAD
PT1	503-0003-00	PRESSURE SENSOR,MOTOROLA

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
1	650-0027-00	TAPE,ACRYLIC FOAM,DOUBLE COATED,.090"
	030-0018-00	PCB,MAIN
	640-0264-00	LABEL,BAR CODE,PCB'S
	650-0026-00	TAPE,KAPTON INSULATING
	800-0023-02	SCHEMATIC,MAIN PCB,M/L
	824-0197-00	ASSY DWG,MULTILANGUAGE,MAIN PCB,FIRST LEVEL
/	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C100	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C101	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C200	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C201	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C202	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C203	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C204	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C205	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C206	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C207	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C208	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C209	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C210	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C213	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C214	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C216	265-0001-00	CAP,RADIAL LEAD,POLYSTYRENE,1.0UF,5%,63V
C218	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C219	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C220	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C221	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C223	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C225	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C226	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C304	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C308	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C309	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C310	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C311	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C312	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C314	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C315	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C316	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C317	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C318	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C319	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
C320	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C321	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C322	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C323	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C324	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C325	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C326	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C327	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C328	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C329	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C330	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C331	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C332	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C400	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C401	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C402	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C404	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C405	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C407	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C409	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C414	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C416	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C420	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C422	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C423	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C502	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C504	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C506	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C509	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C512	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C513	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C601	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C602	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C603	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C604	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C606	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C607	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C608	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C609	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C610	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C611	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C612	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
C613	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C614	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C615	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C617	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C620	261-0022-00	CAP,SMD,CER.,33UF,5%,50V,X7R,1812
C621	250-0024-00	CAP,330UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C623	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C624	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C625	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C626	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C632	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C633	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C634	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C635	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C636	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C637	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C638	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C645	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C646	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C647	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C680	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C681	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C700	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C701	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C702	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C703	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C704	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C705	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C706	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C709	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C715	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C716	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C717	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C719	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C720	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C721	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C725	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C726	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C750	260-0009-00	CAP,CER,450PF,20%,50V,14 PIN DIP SIZE
C799	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C800	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C802	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
C803	268-0001-00	CAPACITOR, SURFACE MOUNT, VARIABLE, 5-30PF, 25V
C805	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C806	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C807	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C808	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C813	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C814	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C815	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C819	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C820	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C825	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C850	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C851	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C900	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C903	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C904	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C906	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C930	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C950	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C951	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C952	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C953	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C999	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C1000	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C1001	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1002	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1003	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1004	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1005	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1006	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1007	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1008	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1009	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1010	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1011	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1101	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C1102	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1103	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1104	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1105	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1107	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1108	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
C1109	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1150	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1151	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1153	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1154	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
D100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D102	308-0013-10	DIODE,ZENER,16V,5%,225MW
D203	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D204	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D205	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D210	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D211	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D212	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D300	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D320	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D321	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D322	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D323	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D324	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D325	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D326	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D328	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D329	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D330	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D331	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D501	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D502	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D503	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D601	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D602	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D603	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D604	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D605	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D607	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D608	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D609	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D613	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D614	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D615	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D616	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D618	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
D619	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D625	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D700	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D701	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D702	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D801	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D802	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D903	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D905	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D906	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1000	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1002	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1102	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1103	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1104	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1105	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1111	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1112	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1113	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1114	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1115	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1116	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
D1117	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1150	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M50C06, SOT-23 PACKAGE
JP610	503-0044-00	SHUTN, 2.5 AMP, BLACK, 94V-O
L601	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L602	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L603	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L604	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
LP200	500-0001-00	LAMP, NEON, A1C
LP201	500-0001-00	LAMP, NEON, A1C
LP202	500-0001-00	LAMP, NEON, A1C
P1	610-0013-00	HEADER, 8 PIN, .100
P2	610-0123-00	CONNECTOR, CONTACT SOCKETS
P3	610-0012-00	HEADER, 7 PIN
P4	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P5	610-0011-00	HEADER, 6 PIN
P6	610-0011-00	HEADER, 6 PIN
P7	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P8	610-0010-00	HEADER, 5 PIN, .100

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
P9	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P10	610-0143-00	HEADER, 3 PIN
P11	610-0123-00	CONNECTOR, CONTACT SOCKETS
Q200	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q201	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q202	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q300	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q301	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q302	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q303	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q304	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q305	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q603	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q605	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q606	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q607	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q609	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q610	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q612	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q680	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q681	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q702	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q803	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q804	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q806	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q807	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q904	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q905	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q910	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q911	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q912	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q913	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1000	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1001	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1103	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q1104	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1106	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1150	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1151	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1152	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1153	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
R200	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R201	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R202	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R203	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R204	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R205	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R206	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R207	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R208	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R209	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R210	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R212	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R213	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R214	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R215	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R216	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R217	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R218	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R219	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R220	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R221	201-0000-00	RES,SMD,0 OHM,1206
R222	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R223	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R224	201-0000-00	RES,SMD,0 OHM,1206
R225	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R226	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R227	206-3324-01	RES,3.32M,1%, .25W,MF,AXIAL LEAD
R229	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R231	201-1543-00	RES,SMD,154K,1%,1206
R232	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R233	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R234	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R235	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R236	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R237	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R238	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R239	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R240	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R241	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R242	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R243	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R244	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R246	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R247	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R248	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R249	201-1543-00	RES,SMD,154K,1%,1206
R250	201-3741-00	RES,SMD,3.74K,1%,0.125W,1206,100 PPM/DEG C
R253	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R260	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R261	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R300	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R303	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R306	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R307	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R310	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R311	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R312	202-0001-00	RESISTOR,100K OHM,0.1%
R313	202-0001-00	RESISTOR,100K OHM,0.1%
R314	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R315	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R316	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R317	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R318	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R319	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R320	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R321	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R323	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R330	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R331	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R333	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R334	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R335	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R336	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R337	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R338	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R339	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R340	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R341	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R342	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R343	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R344	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R345	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R346	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R347	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R350	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R351	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R352	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R353	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R354	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R408	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R409	201-8453-00	RES,SMD,845K,1%,.125W,1206,TC 100PPM/C
R410	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R411	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R412	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R413	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R415	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R418	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R420	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R421	201-1333-00	RES,SMD,133K,1%,.125W,1206,100PPM/DEG C
R424	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R430	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R431	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R435	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R438	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R439	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R442	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R443	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R444	201-4993-00	RES,SMD,499K,1%,.125W,1206
R445	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R446	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R451	201-5903-00	RES,SMD,590K,1%,.125W,1206,100PPM/DEG C
R452	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R453	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R454	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R455	201-7503-00	RES,SMD,750K,1%,.125W,1206
R456	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R501	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R502	201-5231-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 5.23K 1%
R503	205-0017-00	RESISTOR,5.23K OHM,.02%,.1W
R504	205-0018-00	RESISTOR,1.5K OHM,.02%,.1W
R507	205-0027-00	RES,70.0K,.02%,.1W,T10,AXIAL
R508	205-0028-00	RES,22.1K,0.02%,T10,.10W,AXIAL LEAD
R511	205-0019-00	RESISTOR,24.0K OHM,.02%,.1W
R512	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R515	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R516	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R517	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R518	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R519	202-5001-00	RES.SMD,5.00K,0.1%,.125W,1206,T9
R520	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R521	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W
R522	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R523	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R602	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R604	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R606	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R607	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R608	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R610	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R611	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R612	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R613	209-3321-00	RES,SMD,3.32K,0.5%,1206,+/-25PPM/DEGREE C
R614	209-1002-00	RES,SMD,1206,10.0K,.5%,+/-25PPM/DEG C
R615	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R616	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R618	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R619	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R620	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R621	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R622	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R623	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R624	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R626	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R627	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R628	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R629	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R630	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R633	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R635	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R639	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R641	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R650	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R660	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R661	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R662	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R663	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R664	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R667	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R668	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R669	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R680	201-1691-00	RESISTOR, SMD, 1.69K, 1%, 0.125W, 1206
R681	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R682	201-1501-00	RESISTOR, SMD, 1.50K, 1%, .125, 1206
R683	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R704	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R709	201-1002-00	RES, SMT, 1206 PKG, 10.0K, +/-1%
R710	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R711	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R712	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R714	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R716	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R720	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R801	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R802	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R803	201-1623-00	RESISTOR, SMT, 162.0K, 1206 PKG, SCREENED, 1%
R804	201-8252-00	RESISTOR, SURFACE MOUNT, 1206, 82.5K, 1%
R805	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R806	201-2002-00	RES, SMD, 20.0K, 1%, 1206, +/-100 PPM/DEGREE C
R808	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R809	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R810	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R812	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R813	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R814	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R815	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R818	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R819	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R820	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R824	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R825	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R826	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R827	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R840	201-0000-00	RES, SMD, 0 OHM, 1206
R843	201-1002-00	RES, SMT, 1206 PKG, 10.0K, +/-1%
R902	201-1002-00	RES, SMT, 1206 PKG, 10.0K, +/-1%
R903	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R904	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R905	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R906	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R907	201-1623-00	RESISTOR, SMT, 162.0K, 1206 PKG, SCREENED, 1%
R908	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R918	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R919	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R920	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R926	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R927	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R928	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R929	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R930	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R931	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R932	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R933	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R934	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R935	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R936	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R937	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R938	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R939	201-1000-00	RES,SMD,100 OHM,1206,1%
R940	201-1000-00	RES,SMD,100 OHM,1206,1%
R1002	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1003	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1005	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1008	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1009	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1012	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1013	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1021	201-0000-00	RES,SMD,0 OHM,1206
R1101	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1102	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1103	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1105	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1106	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1107	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1108	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1109	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1110	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1114	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1115	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1116	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1130	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R1131	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1132	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R1133	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
R1134	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R1150	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1151	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R1152	201-1272-00	RES,SMD,12.7K,1.0%
R1153	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1154	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1155	201-1272-00	RES,SMD,12.7K,1.0%
R1156	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R1157	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
RP301	228-0001-00	RESISTOR, VARIABLE, SURFACE MOUNT, 2K +/-25% .2W
RP400	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP401	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP402	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP601	225-0004-00	RES,POT,3/8" SINGLE TURN,2K OHM,.5W,10%
T601	360-0008-00	TRANSFORMER,SWITCHING, EL MAIN PCB
TP400	503-0022-00	TEST TERMINAL
TP402	503-0022-00	TEST TERMINAL
TP601	503-0022-00	TEST TERMINAL
TP606	503-0022-00	TEST TERMINAL
TP610	503-0022-00	TEST TERMINAL
TP622	503-0022-00	TEST TERMINAL
TP700	503-0022-00	TEST TERMINAL
TP701	503-0022-00	TEST TERMINAL
TP800	503-0022-00	TEST TERMINAL
TP1000	503-0022-00	TEST TERMINAL
TP1001	503-0022-00	TEST TERMINAL
U200	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U201	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U203	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U204	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U205	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U300	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U301	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U302	482-4053-03	IC, SMT, 4053B TRIPLE 2 CHANNEL ANALOG MULTI/DEMULTIPLER
U303	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U304	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U401	470-0001-03	IC, OP-AMP,TLC27L4, QUAD CMOS, LOW POWER
U402	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U501	482-4051-03	4051 ANALOG MULTIPLEXER, SINGLE 8 CHANNEL
U602	474-0002-04	IC, TO220 PKG, SWITCHING REG,LT1070, 5A HIGH EFF
U603	472-0001-03	IC, SMT, VOLTAGE REG,LP2951,ADJUSTABLE MICROPOWER
U604	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
U605	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U606	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U607	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U608	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U700	502-0009-00	OSCILLATOR,DUAL,CRYSTAL,CLOCK,18.432MHZ/10.75
U703	400-4040-03	COUNTER, 12 BIT BINARY ASYNCHRONOUS
U704	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U705	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U706	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
U708	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U712	400-0138-03	IC,SMT,74HC138,3 TO 8 LINE DECODER,SOIC16
U714	441-0002-02	IC, SMT, 82050, ASYNCHRONOUS COMMUNICATIONS CONTROLLER, PLCC
U716	430-0005-03	IC,SMD,256K BIT SRAM,LOW STANDBY CURRENT
U717	441-0005-03	IC,SMD,DS1210,NONVOLATILE CONTROLLER CHIP
U720	400-0011-03	IC,SMD,74HC11,TRIPLE 3 INPUT POSITIVE & GATE
U800	441-0001-03	IC, SMT, 61830B, DISPLAY CONTROLLER, DOT MATRIX LCD GRAPHIC
U801	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U803	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U804	400-0123-03	IC, SMT, 74HC123A, DUAL TRIGGERABLE MONOSTABLE MULTIVIB, SOIC16
U805	442-0001-03	IC, SMT, MSM6242, DIRECT BUS CONNECTED REAL TIME CLOCK, SOIC
U806	400-0000-03	IC, SMT, 74HC00, QUAD 2-INPUT POSITIVE NAND GATE, S014 PKG
U807	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U810	433-0180-03	EEPROM,93C46,1024 BIT,8 PIN,SOIC
U811	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U900	480-0001-02	IC, SMT, AD7528, DAC, CMOS DUAL 8BIT BUFFERED MULT
U902	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U903	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U906	470-0015-03	IC,SMD,OP-AMP,TL031,LOW POWER/LOW OFFSET
U1000	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U1002	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U1003	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
U1004	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U1006	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U1007	481-0001-02	IC,A TO D,TLC1541,10 BIT SERIAL CONTROL AND ELEVEN INPUTS, PLCC
U1008	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1009	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1010	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U1101	442-0005-03	IC,SMD,LT1032,QUAD LOW POWER LINE DRIVER
U1102	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCEIVER
U1103	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCEIVER

CJ Drawing Designator (Dwg. #824-0197-00), EL Main Board 1st Lvl Assy. 031-0018-01		
Reference Designator	Part Number	Description
U1104	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
X800	502-0004-00	CRYSTAL, SMD, 32.768KHZ
X1000	502-0005-00	CRYSTAL,SMD,10.752,MHZ
CY Drawing Designator (Dwg. #824-0211-00), Main Board 2nd Lvl Assy 032-0007-02		
Reference Designator	Part Number	Description
1	600-0071-00	EMI SHIELD #1 MAIN ECB
2	600-0072-00	EMI SHIELD #2 MAIN ECB,,
4	620-0016-00	BUSHING,SHOULDER,NYLON,#4,.115ID,.145OD,.250L
5	620-0041-00	SCREW, SS, 4-40X1/2", PANHEAD, PHILLIPS
6	620-0054-00	KEPNUT,4-40 TH,ZINC,CLEAR CHROMATE
8	620-0159-00	RIVET,.118-.169 CLAMP THICKNESS,PLASTIC,BLACK
9	620-0160-00	WASHER,.120 ID,.187OD,.06 THICK,WHITE
10	620-0163-00	WASHER,SHLDR,0.114-ID,0.135-OD,NYLON
11	031-0018-01	SUBASSY,MAIN PCB,MULTILANGUAGE
13	650-0026-00	TAPE,KAPTON INSULATING
14	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
16	620-0174-00	SPACER,SELF-RETAINING,.25 LONG,NYLON
17	504-0041-00	WIRE, SOLID, 24 AWG, UNINSULATED
18	600-0239-00	NOMEX,410,.010 THICK
	824-0211-00	ASSY DWG,M/L MAIN PCB,2ND LEVEL
BH800	610-0007-00	BATTERY HOLDER, 20MM LITHIUM BATTERY
BT800	501-0002-00	BATTERY, LITHIUM, 3.0V 180mAH BR2032
C798	260-0002-00	CAPACITOR, CERAMIC, .1MFD, 50V, +/-20%, RADIAL LEAD
PT1	503-0003-00	PRESSURE SENSOR,MOTOROLA

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
1	650-0027-00	TAPE, ACRYLIC FOAM, DOUBLE COATED, .090"
	030-0030-01	M/L MAIN FAB DRAWING
	201-1782-00	RES, SMD, 17.8K, 1%, 1206, +/-100 PPM/DEGREE C
	640-0264-00	LABEL, BAR CODE, PCB'S
	650-0026-00	TAPE, KAPTON INSULATING
	800-0023-01	SCHEMATIC, MAIN PCB, M/L
	824-0242-00	ASSY DWG, M/L MAIN PCB, 1ST LEVEL
C100	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C101	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C200	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C201	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C202	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C203	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C204	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C205	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C206	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C207	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C208	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C209	261-0023-00	CAP, SMD, CER, 4700PF, 5%, 50V, X7R, 1206
C210	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C213	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C214	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C216	265-0001-00	CAP, RADIAL LEAD, POLYSTYRENE, 1.0UF, 5%, 63V
C218	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C219	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C220	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C221	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C223	261-0033-00	CAP, SMD, CER, 0.022UF, 5%, 100V, X7R, 1206
C225	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C226	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C299	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C304	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C308	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C309	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C310	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C311	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C312	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C314	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C315	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C316	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C317	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C318	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
C319	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C320	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C321	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C322	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C323	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C324	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C325	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C326	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C327	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C328	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C329	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C330	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C331	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C332	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C400	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C401	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C402	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C404	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C405	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C407	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C409	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C414	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C416	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C420	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C422	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C423	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C502	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C504	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C506	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C509	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C512	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C513	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C601	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C602	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C603	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C604	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C606	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C607	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C608	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C609	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C610	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C611	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
C612	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C613	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C614	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C615	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C617	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C620	261-0022-00	CAP,SMD,CER,.33UF,5%,50V,X7R,1812
C621	250-0024-00	CAP,330UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C623	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C624	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C625	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C626	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C632	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C633	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C634	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C635	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C636	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C637	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C638	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C645	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C646	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C647	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C680	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C681	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C700	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C701	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C702	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C703	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C704	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C705	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C706	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C709	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C715	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C716	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C717	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C719	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C720	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C721	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C726	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C750	260-0009-00	CAP,CER,450PF,20%,50V,14 PIN DIP SIZE
C798	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C799	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C800	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

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Reference Designator	Part Number	Description
C802	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C803	268-0001-00	CAPACITOR, SURFACE MOUNT, VARIABLE, 5-30PF, 25V
C805	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C806	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C807	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C808	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C813	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C814	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C815	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C819	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C820	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C825	261-0012-00	CAP,SMD,CERAMIC,0.1UF,+/-5
C850	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C851	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C900	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C903	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C904	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C905	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C906	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C930	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C950	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C951	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C952	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C953	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C999	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C1000	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C1001	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1002	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C1003	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1004	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1005	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1006	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1007	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1008	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1009	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1010	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1011	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1101	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C1102	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1103	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1104	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1105	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

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Reference Designator	Part Number	Description
C1107	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1108	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1109	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C1150	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C1151	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1153	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C1154	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
D100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D102	308-0013-10	DIODE,ZENER,16V,5%,225MW
D203	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D204	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D205	308-0003-08	DIODE, ZENER, 6.8V, 5%, 500MW, SURFACE MOUNT
D210	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D211	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D212	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D300	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D320	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D321	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D322	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D323	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D324	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D325	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D326	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D328	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D329	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D330	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D331	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D501	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D502	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D503	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D601	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D602	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D603	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D604	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D605	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D607	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D608	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D609	307-0001-08	SCHOTTKY RECTIFIER,SMT,MLL41PKG,30V
D613	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D614	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D615	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
D616	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D618	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D619	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D625	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D700	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D701	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D702	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D801	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D802	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D903	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D905	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D906	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1000	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1002	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1100	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1101	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1102	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1103	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1104	308-0011-10	DIODE, ZENER, 12V, 5%, SOT-23
D1105	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1111	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1112	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1113	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1114	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1115	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1116	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
D1117	308-0013-10	DIODE, ZENER, 16V, 5%, 225MW
D1150	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, MDAV99, SOT-23 PACKAGE
JP610	503-0044-00	SHUTN, 2.5 AMP, BLACK, 94V-O
L601	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L602	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L603	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L604	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
LP200	500-0001-00	LAMP, NEON, A1C
LP201	500-0001-00	LAMP, NEON, A1C
LP202	500-0001-00	LAMP, NEON, A1C
P1	610-0013-00	HEADER, 8 PIN, .100
P2	610-0123-00	CONNECTOR, CONTACT SOCKETS
P3	610-0012-00	HEADER, 7 PIN
P4	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P5	610-0011-00	HEADER, 6 PIN
P6	610-0011-00	HEADER, 6 PIN

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Reference Designator	Part Number	Description
P7	610-0038-00	HEADER, 10 PIN, .100 CENTER, LOCKING
P8	610-0010-00	HEADER, 5 PIN, .100
P9	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P10	610-0143-00	HEADER, 3 PIN
P11	610-0123-00	CONNECTOR, CONTACT SOCKETS
P12	610-0049-00	HEADER, 2 PIN, .100 CTR
Q200	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q299	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q300	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q301	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q302	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q303	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q304	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q305	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q603	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q605	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q606	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q607	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q609	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q610	301-0004-10	TRANSISTOR, MMBT2222A, SOT-23PKG
Q612	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q680	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q681	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q702	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q803	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q804	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q806	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q807	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q904	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q905	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q910	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q911	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q912	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q913	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1000	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1001	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1103	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q1104	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1106	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1150	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1151	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q1152	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23

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Reference Designator	Part Number	Description
Q1153	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
R200	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R201	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R202	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R203	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R204	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R205	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R206	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R207	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R208	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R209	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R210	200-0001-00	RES,100M,+/-10%,0.25W,HV METAL OXIDE,AXIAL
R212	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R213	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R214	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R215	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R216	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R217	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R220	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R221	201-0000-00	RES,SMD,0 OHM,1206
R222	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R223	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R224	201-0000-00	RES,SMD,0 OHM,1206
R225	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R226	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R227	206-3324-01	RES,3.32M,1%, .25W,MF,AXIAL LEAD
R229	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R231	201-1543-00	RES,SMD,154K,1%,1206
R232	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R233	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R234	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R235	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R236	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R237	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R238	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R239	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R240	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R241	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R242	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R243	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R244	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R246	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R247	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R248	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R249	201-1543-00	RES,SMD,154K,1%,1206
R250	201-3741-00	RES,SMD,3.74K,1%,0.125W,1206,100 PPM/DEG C
R253	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R260	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R261	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R298	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R299	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R300	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R303	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R306	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R307	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R310	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R311	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R312	202-0001-00	RESISTOR,100K OHM,0.1%
R313	202-0001-00	RESISTOR,100K OHM,0.1%
R314	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R315	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R316	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R317	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R318	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R319	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R320	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R321	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R323	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R330	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R331	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R333	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R334	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R335	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R336	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R337	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R338	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R339	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R340	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R341	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R342	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R343	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R344	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R345	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R346	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R347	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R350	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R351	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R352	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R353	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R354	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R408	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R409	201-8453-00	RES,SMD,845K,1%,.125W,1206,TC 100PPM/C
R410	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R411	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R412	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R413	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R415	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R418	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R420	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R421	201-1333-00	RES,SMD,133K,1%,.125W,1206,100PPM/DEG C
R424	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R430	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R431	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R435	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R438	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R439	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R442	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R443	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R444	201-4993-00	RES,SMD,499K,1%,.125W,1206
R445	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R446	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R451	201-5903-00	RES,SMD,590K,1%,.125W,1206,100PPM/DEG C
R452	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R453	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R454	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R455	201-7503-00	RES,SMD,750K,1%,.125W,1206
R456	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R501	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R502	201-5231-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 5.23K 1%
R503	205-0017-00	RESISTOR,5.23K OHM,.02%,.1W
R504	205-0018-00	RESISTOR,1.5K OHM,.02%,.1W
R507	205-0027-00	RES,70.0K,.02%,.1W,T10,AXIAL
R508	205-0028-00	RES,22.1K,0.02%,T10,.10W,AXIAL LEAD
R511	205-0019-00	RESISTOR,24.0K OHM,.02%,.1W
R512	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R515	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R516	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R517	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W
R518	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R519	202-5001-00	RES.SMD,5.00K,0.1%,.125W,1206,T9
R520	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R521	205-0024-00	RESISTOR,3.32K OHM,.02%,.1W
R522	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R523	205-0025-00	RESISTOR,6.81K OHM,.02%,.1W
R602	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R604	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R606	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R607	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R608	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R610	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R611	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R612	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R613	209-3321-00	RES,SMD,3.32K,0.5%,1206,+/-25PPM/DEGREE C
R614	209-1002-00	RES,SMD,1206,10.0K,.5%,+/-25PPM/DEG C
R615	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R616	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R618	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R619	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R620	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R621	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R622	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R623	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R624	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R626	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R627	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R628	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R629	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R630	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R633	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R635	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R639	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R641	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R650	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R660	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R661	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R662	201-5112-00	RES,SMD,51.1K,1%,.125W,1206
R663	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R664	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R667	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R668	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R669	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R680	201-1691-00	RESISTOR,SMD,1.69K,1%,0.125W,1206
R681	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R682	201-1501-00	RESISTOR,SMD,1.50K,1%,.125,1206
R683	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R704	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R709	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R710	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R711	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R712	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R714	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R716	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R720	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R801	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R802	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R803	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R804	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R805	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R806	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R808	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R809	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R810	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R812	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R813	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R814	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R815	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R818	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R819	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R820	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R824	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R825	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R826	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R827	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R840	201-0000-00	RES,SMD,0 OHM,1206
R843	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R902	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R903	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R904	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R905	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R906	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R907	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R908	201-2742-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 27.4K 1%
R918	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R919	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R920	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R926	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R927	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R928	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R929	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R930	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R931	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R932	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R933	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R934	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R935	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R936	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R937	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R938	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R939	201-1000-00	RES,SMD,100 OHM,1206,1%
R940	201-1000-00	RES,SMD,100 OHM,1206,1%
R1002	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1003	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1005	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1008	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1009	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R1012	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1013	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1021	201-0000-00	RES,SMD,0 OHM,1206
R1101	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1102	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1103	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R1105	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1106	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1107	201-1623-00	RESISTOR, SMT, 162.0K,1206 PKG,SCREENED, 1%
R1108	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1109	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1110	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R1114	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R1115	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1116	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R1130	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R1131	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
R1132	201-3402-00	RESISTOR, SMT, 1206,PKG, 34.0K 1%
R1133	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R1134	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R1150	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1151	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R1152	201-1272-00	RES,SMD,12.7K,1.0%
R1153	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1154	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R1155	201-1272-00	RES,SMD,12.7K,1.0%
R1156	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R1157	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
RP301	228-0001-00	RESISTOR, VARIABLE, SURFACE MOUNT, 2K +/-25% .2W
RP400	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP401	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP402	228-0002-00	RES,VAR,SMD,50K,25%,0.20W
RP601	225-0004-00	RES,POT,3/8" SINGLE TURN,2K OHM,.5W,10%
S706	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
S1003	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
T601	360-0008-00	TRANSFORMER,SWITCHING, EL MAIN PCB
TP400	503-0022-00	TEST TERMINAL
TP402	503-0022-00	TEST TERMINAL
TP601	503-0022-00	TEST TERMINAL
TP606	503-0022-00	TEST TERMINAL
TP610	503-0022-00	TEST TERMINAL
TP622	503-0022-00	TEST TERMINAL
TP700	503-0022-00	TEST TERMINAL
TP701	503-0022-00	TEST TERMINAL
TP800	503-0022-00	TEST TERMINAL
TP1000	503-0022-00	TEST TERMINAL
TP1001	503-0022-00	TEST TERMINAL
U200	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U201	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U203	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U204	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U205	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U300	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U301	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U302	482-4053-03	IC, SMT, 4053B TRIPLE 2 CHANNEL ANALOG MULTI/DEMULTIPLEXER
U303	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U304	483-4016-03	IC,SMD,74HC4016,QUAD FET SWITCH,S0-14
U401	470-0001-03	IC, OP-AMP,TLC27L4, QUAD CMOS, LOW POWER
U402	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
U501	482-4051-03	4051 ANALOG MULTIPLEXER, SINGLE 8 CHANNEL
U602	474-0002-04	IC, TO220 PKG, SWITCHING REG,LT1070, 5A HIGH EFF
U603	472-0001-03	IC, SMT, VOLTAGE REG,LP2951,ADJUSTABLE MICROPOWER
U604	470-0002-03	IC, SMT, TL064, OP AMP, LOW INPUT OFFSET
U605	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U606	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U607	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U608	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
U700	502-0009-00	OSCILLATOR,DUAL,CRYSTAL,CLOCK,18.432MHZ/10.75
U703	400-4040-03	COUNTER, 12 BIT BINARY ASYNCHRONOUS
U704	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U705	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U708	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U712	400-0138-03	IC,SMT,74HC138,3 TO 8 LINE DECODER,SOIC16
U714	441-0002-02	IC, SMT, 82050, ASYNCHRONOUS COMMUNICATIONS CONTROLLER, PLCC
U716	430-0005-03	IC,SMD,256K BIT SRAM,LOW STANDBY CURRENT
U717	441-0005-03	IC,SMD,DS1210,NONVOLATILE CONTROLLER CHIP
U720	400-0011-03	IC,SMD,74HC11,TRIPLE 3 INPUT POSITIVE & GATE
U800	441-0001-03	IC, SMT, 61830B, DISPLAY CONTROLLER, DOT MATRIX LCD GRAPHIC
U801	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U803	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U804	400-0123-03	IC, SMT, 74HC123A, DUAL TRIGGERABLE MONOSTABLE MULTIVIB, SOIC16
U805	442-0001-03	IC, SMT, MSM6242, DIRECT BUS CONNECTED REAL TIME CLOCK, SOIC
U806	400-0000-03	IC, SMT, 74HC00, QUAD 2-INPUT POSITIVE NAND GATE, S014 PKG
U807	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U810	433-0180-03	EEPROM,93C46,1024 BIT,8 PIN,SOIC
U811	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U900	480-0001-02	IC, SMT, AD7528, DAC, CMOS DUAL 8BIT BUFFERED MULT
U902	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U903	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U906	470-0015-03	IC,SMD,OP-AMP,TL031,LOW POWER/LOW OFFSET
U1000	440-8031-02	IC, SMT, 80C31, 8 BIT MICROCONTROLLER, PLCC
U1002	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U1004	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U1006	400-T377-03	IC, SMT, 74HCT377, OCTAL D-TYPE FLIP-FLOP (TTL LEVEL), SOIC 20L WIDE PKG
U1007	481-0001-02	IC,A TO D,TLC1541,10 BIT SERIAL CONTROL AND ELEVEN INPUTS, PLCC
U1008	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1009	306-0003-03	DIODE ARRAY,MMAD1108,SOIC16 PKG
U1010	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U1101	442-0005-03	IC,SMD,LT1032,QUAD LOW POWER LINE DRIVER

DY Drawing Designator (Dwg. #824-0242-00), Main Board 1st Lvl Assy 031-0040-00		
Reference Designator	Part Number	Description
U1102	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCIEVER
U1103	442-0004-03	IC,SMD,LTC485,LOW POWER RS485 TRANSCIEVER
U1104	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
X800	502-0004-00	CRYSTAL, SMD, 32.768KHZ
X1000	502-0005-00	CRYSTAL,SMD,10.752,MHZ
DA Drawing Designator (Dwg. #824-0218-00), LCD Main Board 2nd Lvl Assy 032-0006-00		
1	600-0071-00	EMI SHIELD #1 MAIN ECB
2	600-0072-00	EMI SHIELD #2 MAIN ECB,, 1.0000
4	620-0016-00	BUSHING,SHOULDER,NYLON,#4,.115ID,.145OD,.250L
5	620-0041-00	SCREW, SS, 4-40X1/2", PANHEAD, PHILLIPS
6	620-0054-00	KEPNUT,4-40 TH,ZINC,CLEAR CHROMATE
8	620-0047-00	SCREW,6-32X.25,PH,PH,NYLOC,SS
9	620-0013-00	NUT,NYLON,6-32
10	600-0140-00	SPACER,NYLON WASHER
11	031-0040-00	SUBASSY,MAIN PCB,M/L
13	650-0026-00	TAPE,KAPTON INSULATING
14	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
18	600-0036-01	INSULATION PAPER,MAIN PCB
20	650-0021-00	LOCTITE #425 THREAD SEALER
	824-0218-00	ASSY DWG,MAIN PCB,2ND LEVEL M/L LCD/SIRECUST
BH800	610-0007-00	BATTERY HOLDER, 20MM LITHIUM BATTERY
BT800	501-0002-00	BATTERY, LITHIUM, 3.0V 180mAH BR2032
PT1	503-0003-00	PRESSURE SENSOR,MOTOROLA
EF Drawing Designator (Dwg. #824-0211-01), EL Main Board 2nd Lvl Assy. 032-0007-01		
1	600-0071-00	EMI SHIELD #1 MAIN ECB
2	600-0072-00	EMI SHIELD #2 MAIN ECB,, 1.0000
4	620-0016-00	BUSHING,SHOULDER,NYLON,#4,.115ID,.145OD,.250L
5	620-0041-00	SCREW, SS, 4-40X1/2", PANHEAD, PHILLIPS
6	620-0054-00	KEPNUT,4-40 TH,ZINC,CLEAR CHROMATE
8	620-0159-00	RIVET,.118-.169 CLAMP THICKNESS,PLASTIC,BLACK
9	620-0160-00	WASHER,.120 ID,.187OD,.06 THICK,WHITE
10	620-0163-00	WASHER,SHLDR,0.114-ID,0.135-OD,NYLON
11	031-0040-00	SUBASSY,MAIN PCB,M/L
13	650-0026-00	TAPE,KAPTON INSULATING
14	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
16	620-0174-00	SPACER,SELF-RETAINING,.25 LONG,NYLON
17	504-0041-00	WIRE, SOLID, 24 AWG, UNINSULATED
18	600-0239-00	NOMEX,410,.010 THICK
	824-0211-01	ASSY,DWG,EL,M/L,MAIN PCB,2ND LEVEL
BH800	610-0007-00	BATTERY HOLDER, 20MM LITHIUM BATTERY
BT800	501-0002-00	BATTERY, LITHIUM, 3.0V 180mAH BR2032
PT1	503-0003-00	PRESSURE SENSOR,MOTOROLA

DK Drawing Designator (Dwg. #824-0228-00), EL Interconnect Board 031-0016-50		
Reference Designator	Part Number	Description
	030-0016-00	PCB,INTERCONNECT,EL
	640-0265-00	LABEL,BAR CODE PCB
	800-0015-00	SCHEMATIC,REEL,INTERCON/SHIELD/CROWBAR,PCB
	824-0228-00	ASSY DWG,EL MAIN INTERCONNECT BOARD M/L
C1	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C3	256-0003-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 47UF 10% 10 V
C4	256-0001-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 1.0 UF 20% 15V
C5	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C6	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C7	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C8	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C12	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C16	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C17	256-0002-00	CAPACITOR, SURFACE MOUNT, TANTALUM, 10.0 UF 20%, 25V
C101	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
C102	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
C103	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
C104	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
C106	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
C107	260-0001-00	CAP,CER,.01MFD,200V,+/-20%
D1	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D2	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D3	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D4	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D5	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D7	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
P1	610-0174-00	SOCKET,DUAL ROW,26PIN
P2	010-0059-00	CABLE,RND CNDCT FLAT,14 POS,5.5 LONG
P3	504-0053-00	CABLE,11 CNDCT,FLAT RIBBON
P4	504-0054-00	CABLE,3 CNDCT,FLAT RIBBON
Q1	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE
Q2	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q3	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
Q4	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23

DK Drawing Designator (Dwg. #824-0228-00), EL Interconnect Board 031-0016-50		
Reference Designator	Part Number	Description
R1	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R2	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R3	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R4	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R5	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R6	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R7	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R8	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R9	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R10	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R11	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R12	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
S	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
U1	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U2	400-4013-03	IC,4013,DUAL D F.F.,S014 PKG

Main Board Locator

This document provides cross-reference grid locations which correspond to sheets 3 (front side) and 2 (back side) of the Main Board second level assembly drawings, Protocol PNs 824-0211-XX and 824-0218-XX.

In the Protocol Part Number column on the next pages, the dash symbol (–) means that the part is fabricated directly in ECB. Depopulated parts, indicated as “DEPOP.” in the Part Description column, are not shown.

Reference Designator, Protocol Part Number, and Part Description match the Bill of Material.

The last five columns (Schematic Page Titles, Page #, X & Y Coordinates, and Schematic Grid) refer to the Main Board Schematics, Protocol PN 800-0023-XX. Origin for X-Y coordinates is the upper left corner of the page.

This document supports three schematic versions and three assembly drawings, as listed below. Parts unique to the old, revised old, or new schematic/assembly are identified with “a”, “b”, or “c”, as follows:

- | | |
|--|-------------|
| a. Old schematic | 800-0023-00 |
| Old 2nd level assembly drawing | 824-0211-00 |
| b. New schematic | 800-0023-01 |
| New 2nd level EL assembly drawing | 824-0211-01 |
| New 2nd level LCD assembly drawing | 824-0218-00 |
| c. Revised old schematic | 800-0023-02 |
| 2nd level assembly drawing (unchanged) | 824-0211-00 |

Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
BH800	A2	BTT. HOLDER	610-0007-00	DISPLAY CONTROL CPU	7	10.3	5.6	B3
BT800	A2	3V BATT.	501-0002-00	DISPLAY CONTROL CPU	7	10.3	5.6	B3
<i>C100</i>	<i>D6</i>	0.1UF	261-0001-00	<<HIERARCHY>>	1	13.0	0.2	D2
<i>C101</i>	<i>C8</i>	0.1UF	261-0001-00	<<HIERARCHY>>	1	12.6	6.6	B2
C200	C8	220PF 1%	261-0002-00	ECG CIRCUITS	2	1.6	0.5	D8
C201	D8	100PF 1%	261-0010-00	ECG CIRCUITS	2	2.6	0.5	D7
C202	C8	100PF 1%	261-0010-00	ECG CIRCUITS	2	3.8	0.5	D6
C203	C7	220PF 1%	261-0002-00	ECG CIRCUITS	2	1.6	1.5	D8
C204	D8	100PF 1%	261-0010-00	ECG CIRCUITS	2	2.6	1.5	D7
C205	C8	100PF 1%	261-0010-00	ECG CIRCUITS	2	3.8	1.5	D6
C206	C8	220PF 1%	261-0002-00	ECG CIRCUITS	2	1.6	3.3	C8
C207	D8	100PF 1%	261-0010-00	ECG CIRCUITS	2	2.6	3.3	C7
C208	C8	100PF 1%	261-0010-00	ECG CIRCUITS	2	3.8	3.3	C6
C209	C8	4700PF	261-0023-00	ECG CIRCUITS	2	8.8	3.4	C4
C210	C7	0.1UF	261-0001-00	ECG CIRCUITS	2	8.1	1.7	D4
C213	B8	0.047UF	261-0004-00	ECG CIRCUITS	2	1.7	5.4	B8
C214	B8	0.1UF	261-0001-00	ECG CIRCUITS	2	3.0	6.3	B7
C216	B8	1UF, POLY	265-0001-00	ECG CIRCUITS	2	5.3	6.2	B6

*Reference Designators and Assembly Drawing Locations shown in *ITALIC* and left justified are on the BACK of the board.

Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
a C218	C7	390PF	261-0018-00	ECG CIRCUITS	2	9.6	5.7	B3
b,c C218	C7	1000PF	261-0006-00	ECG CIRCUITS	2	9.6	5.7	B3
C219	C7	0.1UF	261-0001-00	ECG CIRCUITS	2	11.7	6.5	B2
C220	C8	0.1UF	261-0001-00	ECG CIRCUITS	2	3.7	9.2	A6
C221	C8	0.1UF	261-0001-00	ECG CIRCUITS	2	3.7	7.6	A6
a C223	C7	0.01UF	261-0012-00	ECG CIRCUITS	2	12.5	3.3	C2
b,c C223	C7	0.022UF	261-0033-00	ECG CIRCUITS	2	12.5	3.3	C2
C224	B8	DEPOP.		ECG CIRCUITS	2	0.9	6.2	B8
C225	B2	0.1UF	261-0001-00	ECG CIRCUITS	2	12.8	0.8	D2
C226	B2	0.047UF	261-0004-00	ECG CIRCUITS	2	2.2	5.4	B7
b C299	B2	0.1UF	261-0001-00	ECG CIRCUITS	2	12.4	5.8	B2
C304	B7	0.1UF	261-0001-00	INVASIVE CHANNEL	3	12.7	6.4	B2
C308	B8	0.1UF	261-0001-00	INVASIVE CHANNEL	3	4.4	8.5	A6
C309	B7	0.1UF	261-0001-00	INVASIVE CHANNEL	3	11.8	5.9	B2
C310	C7	47UF	256-0003-00	INVASIVE CHANNEL	3	9.2	6.7	B4
C311	A8	0.1UF	261-0001-00	INVASIVE CHANNEL	3	5.8	8.5	A5
C312	B8	0.1UF	261-0001-00	INVASIVE CHANNEL	3	3.4	0.1	D7
C314	D7	0.1UF	261-0001-00	INVASIVE CHANNEL	3	5.1	8.5	A6
C315	B3	220PF 1%	261-0002-00	INVASIVE CHANNEL	3	11.8	5.1	B2
C316	B2	220PF 1%	261-0002-00	INVASIVE CHANNEL	3	11.8	7.7	A2
C317	C3	0.1UF	261-0001-00	INVASIVE CHANNEL	3	13.8	0.5	D1
C318	C3	0.1UF	261-0001-00	INVASIVE CHANNEL	3	13.8	1.6	D1
C319	B1	0.01UF	261-0012-00	INVASIVE CHANNEL	3	11.6	2.6	C2
C320	B2	0.01UF	261-0012-00	INVASIVE CHANNEL	3	10.1	1.1	D3
C321	C3	0.1UF	261-0001-00	INVASIVE CHANNEL	3	8.1	1.7	D4
C322	D3	0.1UF	261-0001-00	INVASIVE CHANNEL	3	8.1	2.0	D4
C323	B2	0.01UF	261-0012-00	INVASIVE CHANNEL	3	4.0	1.0	D6
C324	B2	0.01UF	261-0012-00	INVASIVE CHANNEL	3	3.6	2.5	C7
C325	C2	4700PF	261-0023-00	INVASIVE CHANNEL	3	4.0	4.9	B6
C326	D3	4700PF	261-0023-00	INVASIVE CHANNEL	3	4.0	4.2	C6
C327	D3	4700PF	261-0023-00	INVASIVE CHANNEL	3	4.0	5.6	B6
C328	C2	4700PF	261-0023-00	INVASIVE CHANNEL	3	4.0	6.3	B6
C329	C3	0.01UF	261-0012-00	INVASIVE CHANNEL	3	0.9	4.2	C8
C330	C3	0.01UF	261-0012-00	INVASIVE CHANNEL	3	0.9	4.9	B8
C331	D3	0.01UF	261-0012-00	INVASIVE CHANNEL	3	0.9	5.6	B8
C332	C3	0.01UF	261-0012-00	INVASIVE CHANNEL	3	0.9	6.3	B8
C400	B7	0.01UF	261-0012-00	NIBP	4	9.7	1.3	D3
C401	A6	1UF	261-0007-00	NIBP	4	2.7	4.9	B7
C402	A6	1UF	261-0007-00	NIBP	4	3.0	5.8	B7
C404	A7	0.047UF	261-0004-00	NIBP	4	8.6	5.1	B4
C405	B3	0.047UF	261-0004-00	NIBP	4	10.0	5.7	B3
C407	B7	1000PF	261-0006-00	NIBP	4	2.0	2.1	D7

*Reference Designators and Assembly Drawing Locations shown in *ITALIC* and left justified are on the BACK of the board.

Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
D1103	C6	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	6.9	7.1	A5
D1104	C5	MMBZ5242BL	308-0011-10	RS-423/DEFIB SYNC	10	9.1	7.2	A4
<i>D1105</i>	<i>D6</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	12.3	1.0	D2
<i>D1111</i>	<i>C8</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	13.2	5.1	B1
<i>D1112</i>	<i>D8</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	13.7	5.1	B1
<i>D1113</i>	<i>C8</i>	MMBZ5246B	308-0013-10	RS-423/DEFIB SYNC	10	11.1	5.1	B3
<i>D1114</i>	<i>C8</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	11.7	5.1	B2
<i>D1115</i>	<i>C8</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	12.2	5.1	B2
<i>D1116</i>	<i>C8</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	12.7	5.1	B2
<i>D1117</i>	<i>C8</i>	MMBZ5246B	308-0013-10	RS-423/DEFIB SYNC	10	11.1	6.2	B3
<i>D1150</i>	<i>C7</i>	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	1.3	2.5	C8
<i>JP101</i>	<i>B8</i>	NC	-	<<HIERARCHY>>	1	11.9	8.0	A2
<i>JP102</i>	<i>B7</i>	NC	-	<<HIERARCHY>>	1	11.9	8.2	A2
<i>a JP300</i>	<i>B2</i>	NO	-	INVASIVE CHANNEL	3	10.5	8.5	A3
<i>a JP301</i>	<i>B2</i>	NC	-	INVASIVE CHANNEL	3	8.7	9.1	A4
<i>a JP302</i>	<i>B2</i>	NC	-	INVASIVE CHANNEL	3	7.6	8.5	A4
<i>JP608</i>	<i>B6</i>	NC	-	POWER SUPPLY	11	13.0	2.9	C2
<i>JP609</i>	<i>B6</i>	NC	-	POWER SUPPLY	11	13.0	7.6	A2
JP610	D2	JUMPER SHUNT	503-0044-00	RS-423/DEFIB SYNC	10	13.8	1.2	D1
b JP701	D3	SEE SCHEMATIC	-	DISPLAY CONTROL CPU	7	1.7	0.8	D8
LP200	D8	NEON	500-0001-00	ECG CIRCUITS	2	0.6	0.6	D8
LP201	D7	NEON	500-0001-00	ECG CIRCUITS	2	0.6	1.6	D8
LP202	D8	NEON	500-0001-00	ECG CIRCUITS	2	0.6	3.4	C8
L601	A5	10UH	351-1040-01	POWER SUPPLY	11	9.6	5.4	B3
L602	A5	10UH	351-1040-01	POWER SUPPLY	11	9.6	6.3	B3
L603	C3	10UH	351-1040-01	POWER SUPPLY	11	2.8	5.9	B7
L604	C4	10UH	351-1040-01	POWER SUPPLY	11	0.7	0.1	D8
PT1	A7	MPX2050GP	503-0003-00	NIBP	4	5.0	1.9	D6
P1	D3	8PIN HDR	610-0013-00	<<HIERARCHY>>	1	13.6	0.3	D1
<i>P2</i>	<i>C8</i>	11PIN SKT	610-0123-00	<<HIERARCHY>>	1	13.6	1.6	D1
P3	D1	7PIN HDR	610-0012-00	<<HIERARCHY>>	1	13.6	3.8	C1
P4	C1	10PIN HDR	610-0038-00	<<HIERARCHY>>	1	13.6	4.9	B1
P5	C1	6PIN HDR	610-0011-00	<<HIERARCHY>>	1	13.6	7.1	A1
P6	D8	6PIN HDR	610-0011-00	<<HIERARCHY>>	1	0.8	0.5	D8
P7	C7	10PIN HDR	610-0038-00	<<HIERARCHY>>	1	0.9	3.3	C8
P8	C7	5PIN HDR	610-0010-00	<<HIERARCHY>>	1	0.9	7.7	A8
P9	C1	3PIN HDR	610-0022-00	<<HIERARCHY>>	1	13.6	3.1	C1
P10	D2	3PIN HDR	610-0143-00	RS-423/DEFIB SYNC	10	13.8	1.2	D1
<i>P11</i>	<i>B8</i>	3PIN SKT	610-0123-00	<<HIERARCHY>>	1	8.5	0.9	D4
b P12	B1	2PIN JST HDR	610-0049-00	<<HIERARCHY>>	1	8.5	0.1	D4

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
C409	A7	0.1UF	261-0001-00	NIBP	4	8.6	5.4	B4
C414	B7	0.1UF	261-0001-00	NIBP	4	12.8	1.3	D2
C416	B7	0.01UF	261-0012-00	NIBP	4	9.2	3.0	C4
C420	B3	0.1UF	261-0001-00	NIBP	4	3.1	0.7	D7
C422	A2	0.1UF	261-0001-00	NIBP	4	6.4	2.2	D5
C423	B2	0.1UF	261-0001-00	NIBP	4	6.4	3.1	C5
C502	C3	0.1UF	261-0001-00	TEMPERATURES	5	2.7	1.3	D7
C504	C3	0.1UF	261-0001-00	TEMPERATURES	5	2.7	3.9	C7
C506	C3	0.1UF	261-0001-00	TEMPERATURES	5	2.7	5.8	B7
C509	B6	0.1UF	261-0001-00	TEMPERATURES	5	12.1	2.3	D2
C512	C7	4700PF	261-0023-00	TEMPERATURES	5	11.6	6.3	B2
C513	B2	0.01UF	261-0012-00	TEMPERATURES	5	12.1	4.5	C2
C601	A4	47UF	256-0003-00	POWER SUPPLY	11	8.6	6.1	B4
C602	A5	47UF	256-0003-00	POWER SUPPLY	11	8.6	5.7	B4
C603	A5	47UF	256-0003-00	POWER SUPPLY	11	9.2	5.7	B4
C604	A5	47UF	256-0003-00	POWER SUPPLY	11	9.2	6.1	B4
C606	A5	47UF	256-0003-00	POWER SUPPLY	11	10.2	5.7	B3
C607	A5	47UF	256-0003-00	POWER SUPPLY	11	13.1	4.6	C1
C608	C4	10UF	256-0002-00	POWER SUPPLY	11	2.7	3.2	C7
C609	C5	1UF	256-0001-00	POWER SUPPLY	11	2.0	1.5	D7
C610	C5	1UF	256-0001-00	POWER SUPPLY	11	4.8	2.1	D6
C611	C4	47UF	256-0003-00	POWER SUPPLY	11	1.7	6.2	B8
C612	C3	47UF	256-0003-00	POWER SUPPLY	11	3.4	6.2	B7
C613	C5	10UF	256-0002-00	POWER SUPPLY	11	4.0	6.7	B6
C614	C4	47UF	256-0003-00	POWER SUPPLY	11	4.0	6.3	B6
C615	A5	47UF	256-0003-00	POWER SUPPLY	11	10.2	6.1	B3
C617	A5	47UF	256-0003-00	POWER SUPPLY	11	13.1	6.8	B1
C620	C4	0.33UF	261-0022-00	POWER SUPPLY	11	4.5	4.4	C6
C621	C4	330UF	250-0024-00	POWER SUPPLY	11	5.3	5.0	B6
C623	C5	0.1UF	261-0001-00	POWER SUPPLY	11	0.1	2.7	C8
C624	C4	10UF	256-0002-00	POWER SUPPLY	11	1.2	5.1	B2
C625	B5	0.1UF	261-0001-00	POWER SUPPLY	11	12.1	7.1	B2
C626	B4	47UF	256-0003-00	POWER SUPPLY	11	12.6	3.2	C2
C632	B5	0.1UF	261-0001-00	POWER SUPPLY	11	12.0	4.3	C2
C633	A5	0.1UF	261-0001-00	POWER SUPPLY	11	13.2	0.6	D1
C634	C6	0.01UF	261-0012-00	OPTO COUPLERS	12	3.9	8.0	A6
C635	C6	0.1UF	261-0001-00	POWER SUPPLY	11	5.3	4.7	B6
C636	C6	0.1UF	261-0001-00	POWER SUPPLY	11	5.3	5.3	B6
C637	C5	0.1UF	261-0001-00	POWER SUPPLY	11	5.3	4.4	C6
C638	B5	220PF 1%	261-0002-00	POWER SUPPLY	11	7.5	7.3	A4
C645	B4	0.01UF	261-0012-00	POWER SUPPLY	11	10.1	7.9	A3
C646	B4	0.01UF	261-0012-00	POWER SUPPLY	11	10.7	2.8	C3

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
C647	C5	0.1UF	261-0001-00	POWER SUPPLY	11	5.8	1.8	D5
C680	C7	100PF 1%	261-0010-00	OPTO COUPLERS	12	5.3	6.4	B6
C681	B6	100PF 1%	261-0010-00	OPTO COUPLERS	12	11.3	3.9	C2
C700	C3	10UF	256-0002-00	DISPLAY CONTROL CPU	7	1.7	7.5	A8
C701	D6	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	6.7	8.9	A5
C702	C4	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	7.7	8.9	A4
C703	C6	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	2.8	3.3	C7
C704	D4	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	8.2	8.9	A4
C705	D6	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	7.2	8.9	A4
C706	C4	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	10.3	4.5	C3
C709	C3	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	11.4	4.4	C2
C715	D5	10UF	256-0002-00	DISPLAY CONTROL CPU	7	5.1	8.6	A6
C716	C3	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	6.2	8.9	A5
C717	B3	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	13.6	6.1	B1
C719	C2	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	5.7	8.9	A5
C720	B1	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	2.8	1.9	D7
C721	D2	0.01UF	261-0012-00	DISPLAY CONTROLLER	8	0.5	1.7	D8
C726	D7	390PF	261-0018-00	DISPLAY CONTROL CPU	8	2.4	5.2	B7
C750	D3	450PF	260-0009-00	DISPLAY CONTROL CPU	7	0.4	1.9	D8
a C798	B6	0.1UF	260-0002-00	DISPLAY CONTROL CPU	7	10.2	6.0	B3
b C798	B4	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	10.2	6.0	B3
C799	C3	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	10.4	5.1	B3
C800	C3	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	8.8	5.9	B4
C802	D5	22PF	261-0021-00	DISPLAY CONTROLLER	8	5.7	8.0	A5
C803	D4	5-30PF	268-0001-00	DISPLAY CONTROLLER	8	5.6	7.6	A5
C805	D3	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	11.3	0.6	D2
C806	D4	0.1UF	261-0001-00	DISPLAY CONTROL CPU	7	4.9	1.4	D6
C807	B7	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	2.6	3.7	C7
C808	C7	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	8.3	2.7	C4
C813	B1	1UF	256-0001-00	DISPLAY CONTROLLER	8	10.3	4.6	C3
C814	C7	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	10.6	0.6	D3
C815	B4	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	12.3	4.8	B2
C819	C7	390PF	261-0018-00	DISPLAY CONTROL CPU	8	3.2	4.8	C7
C820	C7	390PF	261-0018-00	DISPLAY CONTROL CPU	8	4.8	4.4	C6
C825	C2	0.01UF	261-0012-00	DISPLAY CONTROLLER	8	5.0	5.3	B6
C850	D5	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	8.0	8.4	A4
C851	C7	0.1UF	261-0001-00	DISPLAY CONTROLLER	8	10.7	8.8	A3
C900	B7	0.1UF	261-0001-00	ANALOG OUTPUT/SPKR	9	8.3	0.6	D4
C903	A1	1UF	256-0001-00	ANALOG OUTPUT/SPKR	9	12.1	0.6	D2
C904	B1	1UF	256-0001-00	ANALOG OUTPUT/SPKR	9	11.6	4.6	C2
C905	A7	0.022UF	261-0008-00	ANALOG OUTPUT/SPKR	9	9.9	5.7	B3
C906	A8	0.1UF	261-0001-00	ANALOG OUTPUT/SPKR	9	9.6	7.2	A3

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
C930	A7	0.1UF	261-0001-00	ANALOG OUTPUT/SPKR	9	11.0	5.0	B3
C950	A7	0.1UF	261-0001-00	ANALOG OUTPUT/SPKR	9	12.1	1.5	D2
C951	A7	0.1UF	261-0001-00	ANALOG OUTPUT/SPKR	9	11.6	3.6	C2
C952	A2	10UF	256-0002-00	ANALOG OUTPUT/SPKR	9	12.4	3.6	C2
C953	B2	10UF	256-0002-00	ANALOG OUTPUT/SPKR	9	12.9	1.4	D2
C955	B7	DEPOP		ANALOG OUTPUT/SPKR	9	14.5	3.8	C1
C999	A8	390PF	261-0018-00	ANALOG OUTPUT/SPKR	9	11.0	6.2	B3
C1000	B3	10UF	256-0002-00	DATA ACQUISITION CPU	6	1.1	1.3	D8
C1001	A3	22PF	261-0021-00	DATA ACQUISITION CPU	6	3.4	1.0	D7
C1002	A3	22PF	261-0021-00	DATA ACQUISITION CPU	6	3.4	1.4	D7
C1003	A6	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	3.7	8.8	A6
C1004	A4	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	4.4	8.8	A6
C1005	A5	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	5.1	8.8	A6
C1006	A4	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	5.8	8.8	A5
C1007	B3	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	6.5	8.8	A5
C1008	A5	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	7.2	8.8	A5
C1009	B3	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	7.9	8.8	A4
C1010	A6	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	3.7	8.3	A6
C1011	B6	0.1UF	261-0001-00	DATA ACQUISITION CPU	6	3.7	7.8	A6
C1101	D2	1UF	256-0001-00	RS-423/DEFIB SYNC	10	9.6	4.6	C3
C1102	C4	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	5.9	7.9	A5
C1103	B4	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	5.9	6.5	B5
C1104	D7	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	3.2	5.2	B7
C1105	C7	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	6.2	5.4	B5
C1107	D8	0.01UF	261-0012-00	RS-423/DEFIB SYNC	10	8.2	5.1	B4
C1108	D8	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	7.9	6.3	B4
C1109	D8	0.1UF	261-0001-00	RS-423/DEFIB SYNC	10	7.8	5.2	B4
C1150	B4	0.01UF	261-0012-00	RS-423/DEFIB SYNC	10	11.6	3.6	C2
C1151	B4	1000PF	261-0006-00	RS-423/DEFIB SYNC	10	9.2	3.7	C4
C1153	B5	1000PF	261-0006-00	RS-423/DEFIB SYNC	10	2.9	2.2	D7
C1154	B8	0.01UF	261-0012-00	RS-423/DEFIB SYNC	10	3.4	3.2	C7
D100	C8	BAV99	306-0001-10	<<HIERARCHY>>	1	12.1	6.4	B2
D101	C8	BAV99	306-0001-10	<<HIERARCHY>>	1	11.7	6.4	B2
D102	C8	MMBZ5246B	308-0013-10	RS-423/DEFIB SYNC	10	13.3	1.7	D1
D203	C7	BAV99	306-0001-10	ECG CIRCUITS	2	10.4	6.8	B3
D204	C8	MLL5235B	308-0003-08	POWER SUPPLY	11	10.5	0.5	D3
D205	C8	MLL5235B	308-0003-08	POWER SUPPLY	11	11.4	0.5	D2
D210	C8	BAV99	306-0001-10	ECG CIRCUITS	2	13.7	1.6	D1
D211	B8	BAV99	306-0001-10	ECG CIRCUITS	2	14.3	1.6	D1
D212	B8	BAV99	306-0001-10	ECG CIRCUITS	2	2.2	6.5	B7
D300	A7	BAV99	306-0001-10	INVASIVE CHANNEL	3	11.0	0.8	D3
D320	A8	BAV99	306-0001-10	INVASIVE CHANNEL	3	13.2	0.2	D1

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D321	A8	BAV99	306-0001-10	INVASIVE CHANNEL	3	13.2	1.3	D1
D322	B7	BAV99	306-0001-10	INVASIVE CHANNEL	3	2.0	3.6	C7
D323	B6	BAV99	306-0001-10	INVASIVE CHANNEL	3	2.0	4.3	C7
D324	C7	BAV99	306-0001-10	INVASIVE CHANNEL	3	2.0	5.0	B7
D325	B7	BAV99	306-0001-10	INVASIVE CHANNEL	3	2.0	5.7	B7
D326	A8	BAV99	306-0001-10	INVASIVE CHANNEL	3	4.8	0.9	D6
D328	A8	BAV99	306-0001-10	INVASIVE CHANNEL	3	7.5	1.1	D4
D329	A8	BAV99	306-0001-10	INVASIVE CHANNEL	3	7.5	2.6	C4
D330	B7	BAV99	306-0001-10	INVASIVE CHANNEL	3	1.6	6.3	B8
D331	B7	BAV99	306-0001-10	INVASIVE CHANNEL	3	2.4	6.3	B7
D501	B6	BAV99	306-0001-10	TEMPERATURES	5	1.7	5.9	B7
D502	B6	BAV99	306-0001-10	TEMPERATURES	5	1.7	4.0	C7
D503	C6	BAV99	306-0001-10	TEMPERATURES	5	1.7	1.4	D7
D601	B4	MBRL130	307-0001-08	POWER SUPPLY	11	7.8	6.3	B4
D602	B5	RLS4606	306-0002-08	POWER SUPPLY	11	7.8	6.7	B4
D603	B4	MBRL130	307-0001-08	POWER SUPPLY	11	7.8	5.5	B4
D604	A5	RLS4606	306-0002-08	POWER SUPPLY	11	7.8	5.1	B4
D605	C5	RLS4606	306-0002-08	POWER SUPPLY	11	1.2	1.0	D8
D607	C5	RLS4606	306-0002-08	POWER SUPPLY	11	5.2	6.9	B6
D608	C4	MBRL130	307-0001-08	POWER SUPPLY	11	5.2	6.3	B6
D609	C4	MBRL130	307-0001-08	POWER SUPPLY	11	5.2	6.0	B6
D613	C4	RLS4606	306-0002-08	POWER SUPPLY	11	5.2	5.7	B6
D614	B5	BAV99	306-0001-10	POWER SUPPLY	11	9.4	1.6	D3
D615	B5	BAV99	306-0001-10	POWER SUPPLY	11	11.5	1.6	D2
D616	B5	BAV99	306-0001-10	POWER SUPPLY	11	8.4	3.7	C4
D618	C4	RLS4606	306-0002-08	POWER SUPPLY	11	5.8	2.6	C5
D619	C5	BAV99	306-0001-10	POWER SUPPLY	11	4.8	0.7	D6
<i>D625</i>	<i>B5</i>	BAV99	306-0001-10	POWER SUPPLY	11	7.7	2.8	C4
D700	C3	BAV99	306-0001-10	DISPLAY CONTROL CPU	7	1.5	6.8	B8
D701	D4	BAV99	306-0001-10	DISPLAY CONTROL CPU	7	5.1	7.2	A6
<i>D702</i>	<i>D5</i>	BAV99	306-0001-10	DISPLAY CONTROL CPU	7	4.0	6.9	B6
D801	B5	BAV99	306-0001-10	DISPLAY CONTROLLER	8	11.7	4.3	C2
<i>D802</i>	<i>C5</i>	BAV99	306-0001-10	DISPLAY CONTROLLER	8	6.5	8.7	A5
D902	A2	DEPOP.		ANALOG OUTPUT/SPKR	9	14.5	2.8	C1
D903	C6	BAV99	306-0001-10	ANALOG OUTPUT/SPKR	9	3.6	4.8	B6
<i>D905</i>	<i>A8</i>	BAV99	306-0001-10	ANALOG OUTPUT/SPKR	9	12.1	4.8	B2
<i>D906</i>	<i>A8</i>	BAV99	306-0001-10	ANALOG OUTPUT/SPKR	9	11.2	0.8	D2
D1000	B3	BAV99	306-0001-10	DATA ACQUISITION CPU	6	1.4	0.5	D8
D1002	A3	BAV99	306-0001-10	DATA ACQUISITION CPU	6	12.4	4.1	C2
D1100	C5	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	7.6	7.1	A4
D1101	C5	BAV99	306-0001-10	RS-423/DEFIB SYNC	10	8.3	7.1	A4
D1102	C6	MMBZ5242BL	308-0011-10	RS-423/DEFIB SYNC	10	10.3	7.3	A3

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
Q200	B5	MMBT3904	301-0001-10	ECG CIRCUITS	2	13.1	7.0	B2
a Q201	C7	MMBT3906	301-0002-10	ECG CIRCUITS	2	8.1	6.9	B4
a Q202	B7	MMBT3904	301-0001-10	ECG CIRCUITS	2	8.1	6.1	B4
b Q299	B8	MMBT3906	301-0002-10	ECG CIRCUITS	2	13.1	5.9	B1
Q300	A7	MMBT2222A	301-0004-10	INVASIVE CHANNEL	3	11.7	0.6	D2
Q301	A8	MMBT2907A	301-0005-10	INVASIVE CHANNEL	3	12.6	3.1	C2
Q302	A8	MMBT2222A	301-0004-10	INVASIVE CHANNEL	3	5.3	0.6	D6
Q303	A7	MMBT2907A	301-0005-10	INVASIVE CHANNEL	3	5.2	2.9	C6
Q304	A8	MMBT3904	301-0001-10	INVASIVE CHANNEL	3	12.3	2.6	C2
Q305	A8	MMBT3904	301-0001-10	INVASIVE CHANNEL	3	4.2	2.3	D6
Q603	C5	MMBTA63	301-0003-10	POWER SUPPLY	11	2.5	0.6	D7
Q605	C5	MMBT3906	301-0002-10	POWER SUPPLY	11	4.0	1.7	D6
Q606	C5	MMBT3904	301-0001-10	POWER SUPPLY	11	2.9	4.1	C7
Q607	C5	MMBTA63	301-0003-10	POWER SUPPLY	11	1.1	2.9	C8
Q609	C5	MMBT3904	301-0001-10	POWER SUPPLY	11	2.6	2.3	D7
Q610	B5	MMBT2222A	301-0004-10	POWER SUPPLY	11	9.1	2.5	C4
Q612	B5	MMBT2907A	301-0005-10	POWER SUPPLY	11	9.1	8.0	A4
Q680	B3	MMBT3906	301-0002-10	OPTO COUPLERS	12	9.2	3.1	C4
Q681	C3	MMBT3906	301-0002-10	OPTO COUPLERS	12	6.1	5.9	B5
Q702	D5	MMBT3904	301-0001-10	DISPLAY CONTROL CPU	7	4.6	8.7	A6
Q803	C3	MMBT3904	301-0001-10	DISPLAY CONTROLLER	8	13.3	5.5	B1
Q804	C3	MMBT3904	301-0001-10	DISPLAY CONTROLLER	8	13.8	6.4	B1
Q806	B5	MMBT3906	301-0002-10	DISPLAY CONTROLLER	8	13.3	3.2	C1
Q807	B5	2N7002	301-0007-10	DISPLAY CONTROLLER	8	13.0	4.4	C2
Q904	C4	MMBT3904	301-0001-10	ANALOG OUTPUT/SPKR	9	4.4	4.1	C6
Q905	A2	2N7002	301-0007-10	ANALOG OUTPUT/SPKR	9	7.5	4.4	C5
Q910	C6	MMBT3904	301-0001-10	ANALOG OUTPUT/SPKR	9	5.3	8.4	A6
Q911	C6	MMBT3904	301-0001-10	ANALOG OUTPUT/SPKR	9	5.3	7.5	A6
Q912	C6	MMBT3904	301-0001-10	ANALOG OUTPUT/SPKR	9	4.5	6.5	B6
Q913	C6	MMBT3904	301-0001-10	ANALOG OUTPUT/SPKR	9	3.7	7.0	B6
Q1000	B5	MMBT3904	301-0001-10	DATA ACQUISITION CPU	6	1.6	2.6	C8
Q1001	B5	MMBT3904	301-0001-10	DATA ACQUISITION CPU	6	2.2	2.8	C7
Q1103	D2	MMBT3906	301-0002-10	RS-423/DEFIB SYNC	10	10.5	1.7	D3
Q1104	D2	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	10.5	2.3	D3
Q1106	D2	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	8.7	1.4	D4
Q1150	B5	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	10.5	3.4	C3
Q1151	B5	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	3.3	1.9	D7
Q1152	B2	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	4.3	2.4	C6
Q1153	B2	MMBT3904	301-0001-10	RS-423/DEFIB SYNC	10	5.4	2.9	C6
RP301	C7	2K	228-0001-00	INVASIVE CHANNEL	3	9.7	6.5	B3
RP400	B7	50K	228-0002-00	NIBP	4	11.0	1.6	D3
RP401	B6	50K	228-0002-00	NIBP	4	13.0	3.8	C2

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
RP402	A7	50K	228-0002-00	NIBP	4	7.5	8.1	A4
RP601	B4	2K	225-0004-00	POWER SUPPLY	11	6.9	3.3	C5
R200	D8	39.2K	201-3922-00	ECG CIRCUITS	2	1.1	0.3	D8
R201	C8	82.5K	201-8252-00	ECG CIRCUITS	2	2.1	0.3	D7
R202	C8	162K	201-1623-00	ECG CIRCUITS	2	3.3	0.3	D7
R203	D7	39.2K	201-3922-00	ECG CIRCUITS	2	1.1	1.3	D8
R204	C7	82.5K	201-8252-00	ECG CIRCUITS	2	2.1	1.3	D7
R205	C7	162K	201-1623-00	ECG CIRCUITS	2	3.3	1.3	D7
R206	D8	39.2K	201-3922-00	ECG CIRCUITS	2	1.1	3.1	C8
R207	C8	82.5K	201-8252-00	ECG CIRCUITS	2	2.1	3.1	C7
R208	C8	162K	201-1623-00	ECG CIRCUITS	2	3.2	3.1	C7
R209	C8	100M	200-0001-00	ECG CIRCUITS	2	7.1	0.2	D5
R210	C8	100M	200-0001-00	ECG CIRCUITS	2	7.1	2.1	D5
R212	C7	10K	201-1002-00	ECG CIRCUITS	2	9.7	3.4	C3
R213	C8	10K	201-1002-00	ECG CIRCUITS	2	9.7	1.1	D3
R214	C8	10K	201-1002-00	ECG CIRCUITS	2	9.7	1.9	D3
R215	B8	2.21K	201-2211-00	ECG CIRCUITS	2	10.2	0.9	D3
R216	C8	2.21K	201-2211-00	ECG CIRCUITS	2	10.1	2.2	D3
R217	C8	22.1K	201-2212-00	ECG CIRCUITS	2	11.4	0.9	D2
<i>a R218</i>	<i>C2</i>	47.5K	201-4752-00	ECG CIRCUITS	2	8.3	5.7	B4
<i>a R219</i>	<i>C2</i>	47.5K	201-4752-00	ECG CIRCUITS	2	8.3	7.2	A4
R220	C8	22.1K	201-2212-00	ECG CIRCUITS	2	11.4	2.6	C2
R221	B7	0 OHM	201-0000-00	ECG CIRCUITS	2	1.3	5.7	B8
R222	B8	39.2K	201-3922-00	ECG CIRCUITS	2	1.0	5.3	B8
R223	B8	10K	201-1002-00	ECG CIRCUITS	2	6.6	5.4	B5
R224	C7	0 OHM	201-0000-00	ECG CIRCUITS	2	8.9	6.0	B4
R225	C8	51.1K	201-5112-00	ECG CIRCUITS	2	7.7	5.4	B4
R226	B8	1K	201-1001-00	ECG CIRCUITS	2	4.4	6.2	B6
R227	B8	3.32M	206-3324-01	ECG CIRCUITS	2	6.6	6.2	B5
<i>a R229</i>	<i>C7</i>	17.8K	201-1782-00	ECG CIRCUITS	2	8.9	5.3	B4
<i>b,c R229</i>	<i>C7</i>	22.1K	201-2212-00	ECG CIRCUITS	2	8.9	5.3	B4
R231	C7	154K	201-1543-00	ECG CIRCUITS	2	9.5	6.4	B3
R232	C7	221K	201-2213-00	ECG CIRCUITS	2	10.9	5.6	B3
R233	C7	51.1K	201-5112-00	ECG CIRCUITS	2	11.4	6.0	B2
R234	C7	51.1K	201-5112-00	ECG CIRCUITS	2	11.4	8.0	A2
R235	C7	221K	201-2213-00	ECG CIRCUITS	2	10.9	8.3	A3
R236	B5	47.5K	201-4752-00	ECG CIRCUITS	2	12.5	7.0	B2
R237	B5	10K	201-1002-00	ECG CIRCUITS	2	13.2	6.3	B1
R238	B8	4.75K	201-4751-00	ECG CIRCUITS	2	3.8	7.2	A6

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R239	C8	4.75K	201-4751-00	ECG CIRCUITS	2	3.7	4.0	C6
R240	C8	4.75K	201-4751-00	ECG CIRCUITS	2	3.7	4.3	C6
R241	B8	47.5K	201-4752-00	ECG CIRCUITS	2	1.0	4.1	C8
R242	C8	47.5K	201-4752-00	ECG CIRCUITS	2	2.3	4.2	C7
R243	B8	10K	201-1002-00	ECG CIRCUITS	2	5.6	5.8	B5
R244	C7	100K	201-1003-00	ECG CIRCUITS	2	9.1	3.2	C4
R246	C7	162K	201-1623-00	ECG CIRCUITS	2	9.1	1.1	D4
R247	B8	475K	201-4753-00	ECG CIRCUITS	2	9.1	1.8	D4
R248	C8	6.98K	201-6981-00	ECG CIRCUITS	2	13.0	3.3	C1
R249	C8	154K	201-1543-00	ECG CIRCUITS	2	14.0	2.9	C1
R250	B7	3.74K	201-3741-00	ECG CIRCUITS	2	0.5	5.7	B8
R253	C1	274 OHM	201-2740-00	ECG CIRCUITS	2	1.2	2.6	C8
R260	C1	1K	201-1001-00	ECG CIRCUITS	2	14.0	2.1	D1
R261	B2	1K	201-1001-00	ECG CIRCUITS	2	0.6	4.6	C8
b R298	B5	10K	201-1002-00	ECG CIRCUITS	2	13.8	5.6	B1
b R299	B2	1.00M	201-1004-00	ECG CIRCUITS	2	12.4	6.4	B2
R300	B8	100K	201-1003-00	INVASIVE CHANNEL	3	8.8	0.5	D4
R303	B8	100K	201-1003-00	INVASIVE CHANNEL	3	11.1	3.5	C3
R306	C7	475K	201-4753-00	INVASIVE CHANNEL	3	7.5	5.9	B4
R307	C7	475K	201-4753-00	INVASIVE CHANNEL	3	7.5	6.8	B4
R310	B7	4.75K	201-4751-00	INVASIVE CHANNEL	3	10.5	5.6	B3
R311	B7	4.75K	201-4751-00	INVASIVE CHANNEL	3	10.5	7.2	A3
R312	B7	100K 0.1%	202-0001-00	INVASIVE CHANNEL	3	11.7	5.6	B2
R313	B7	100K 0.1%	202-0001-00	INVASIVE CHANNEL	3	11.7	7.2	A2
R314	A7	4.75K	201-4751-00	INVASIVE CHANNEL	3	11.9	4.3	C2
R315	B7	4.75K	201-4751-00	INVASIVE CHANNEL	3	13.7	7.7	A1
R316	B8	10 OHM	201-100Z-00	INVASIVE CHANNEL	3	11.8	1.2	D2
R317	B8	10 OHM	201-100Z-00	INVASIVE CHANNEL	3	12.7	2.3	C2
R318	B7	4.75K	201-4751-00	INVASIVE CHANNEL	3	13.6	6.4	B1
R319	C7	27.4K	201-2742-00	INVASIVE CHANNEL	3	8.9	5.8	B4
R320	C7	27.4K	201-2742-00	INVASIVE CHANNEL	3	8.9	6.9	B4
R321	C7	6.34K	201-6341-00	INVASIVE CHANNEL	3	9.4	6.1	B3
R323	A8	221K	201-2213-00	INVASIVE CHANNEL	3	13.6	2.4	C1
R330	A8	100K	201-1003-00	INVASIVE CHANNEL	3	1.1	0.5	D8
R331	A2	10 OHM	201-100Z-00	INVASIVE CHANNEL	3	5.4	1.3	D6
R333	A8	4.75K	201-4751-00	INVASIVE CHANNEL	3	1.2	1.1	D8
R334	A7	100K	201-1003-00	INVASIVE CHANNEL	3	1.1	3.0	C8
R335	A2	10 OHM	201-100Z-00	INVASIVE CHANNEL	3	5.3	2.2	D6
R336	A7	221K	201-2213-00	INVASIVE CHANNEL	3	6.0	2.3	D5
R337	B2	1.00K	201-1001-00	INVASIVE CHANNEL	3	11.5	2.1	D2
R338	B2	1.00K	201-1001-00	INVASIVE CHANNEL	3	10.0	1.5	D3
R339	B2	1.00K	201-1001-00	INVASIVE CHANNEL	3	4.0	1.4	D6

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R340	A2	1.00K	201-1001-00	INVASIVE CHANNEL	3	3.0	2.2	D7
R341	B3	22.1K	201-2212-00	INVASIVE CHANNEL	3	5.3	3.6	C6
R342	C3	4.75K	201-4751-00	INVASIVE CHANNEL	3	3.5	3.9	C7
R343	B3	4.75K	201-4751-00	INVASIVE CHANNEL	3	3.5	4.6	C7
R344	C3	4.75K	201-4751-00	INVASIVE CHANNEL	3	3.5	5.3	B7
R345	B3	4.75K	201-4751-00	INVASIVE CHANNEL	3	3.5	6.0	B7
R346	C2	10.0K	201-1002-00	INVASIVE CHANNEL	3	6.0	1.3	D5
R347	C3	10.0K	201-1002-00	INVASIVE CHANNEL	3	10.3	1.8	D3
R350	C3	100K	201-1003-00	INVASIVE CHANNEL	3	9.8	2.3	C3
R351	B2	100K	201-1003-00	INVASIVE CHANNEL	3	10.3	6.0	B3
R352	B3	100K	201-1003-00	INVASIVE CHANNEL	3	10.3	6.7	B3
R353	C3	100K	201-1003-00	INVASIVE CHANNEL	3	6.6	1.3	D5
R354	B3	22.1K	201-2212-00	INVASIVE CHANNEL	3	0.9	3.6	C8
R408	B7	10.0K	201-1002-00	NIBP	4	8.5	2.7	C4
R409	B7	845K	201-8453-00	NIBP	4	9.8	2.7	C3
R410	A6	4.75K	201-4751-00	NIBP	4	13.8	2.4	D1
R411	A7	221K	201-2213-00	NIBP	4	3.5	6.0	B7
R412	A7	221K	201-2213-00	NIBP	4	4.3	5.1	B6
R413	A7	4.75K	201-4751-00	NIBP	4	6.4	5.8	B5
R415	B3	332K	201-3323-00	NIBP	4	9.6	5.1	B3
R418	A7	511 OHM	201-5110-00	NIBP	4	6.9	6.9	B5
R420	B7	1.00M	201-1004-00	NIBP	4	9.6	1.7	D3
R421	A7	133K	201-1333-00	NIBP	4	11.6	1.3	D2
R424	B3	332K	201-3323-00	NIBP	4	12.7	1.8	D2
R430	A4	4.75K	201-4751-00	NIBP	4	1.2	6.9	B8
R431	B7	10.0K	201-1002-00	NIBP	4	8.5	1.7	D4
R435	B2	100K	201-1003-00	NIBP	4	1.4	1.2	D8
R438	A8	4.75K	201-4751-00	NIBP	4	0.3	3.2	C8
R439	A7	475K	201-4753-00	NIBP	4	8.5	4.6	C4
R442	B3	100K	201-1003-00	NIBP	4	1.4	2.8	C8
R443	A7	4.75K	201-4751-00	NIBP	4	2.7	4.0	C7
R444	A7	499K	201-4993-00	NIBP	4	7.6	7.4	A4
R445	B3	221K	201-2213-00	NIBP	4	12.2	5.5	B2
R446	B3	475K	201-4753-00	NIBP	4	12.2	6.2	B2
R451	B2	590K	201-5903-00	NIBP	4	11.6	1.8	D2
R452	B3	332K	201-3323-00	NIBP	4	8.1	6.9	B4
R453	A7	332K	201-3323-00	NIBP	4	11.5	4.3	C2
R454	A7	475K	201-4753-00	NIBP	4	11.5	3.4	C2
R455	B3	750K	201-7503-00	NIBP	4	12.1	3.9	C2
R456	B3	475K	201-4753-00	NIBP	4	1.9	4.6	C8
R501	B7	34.0K	201-3402-00	TEMPERATURES	5	10.1	6.5	B3
R502	B7	5.23K	201-5231-00	TEMPERATURES	5	10.1	7.2	A3

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R503	B6	5.23K .02%T10	205-0017-00	TEMPERATURES	5	3.4	0.6	D7
R504	B6	1.50K .02%T10	205-0018-00	TEMPERATURES	5	3.4	1.4	D7
R507	B6	70.0K .02%T10	205-0027-00	TEMPERATURES	5	3.4	2.5	C7
R508	B6	22.1K .02%T10	205-0028-00	TEMPERATURES	5	3.4	4.0	C7
R511	B6	24.0K .02%T10	205-0019-00	TEMPERATURES	5	3.4	5.1	B7
R512	B6	6.81K .02%T10	205-0025-00	TEMPERATURES	5	3.4	5.9	B7
R515	B7	100K	201-1003-00	TEMPERATURES	5	11.5	6.9	B2
R516	B6	59.0K .02%T10	205-0023-00	TEMPERATURES	5	5.6	3.1	C5
R517	B6	3.32K .02%T10	205-0024-00	TEMPERATURES	5	5.6	3.8	C5
R518	B6	6.81K .02%T10	205-0025-00	TEMPERATURES	5	5.6	4.5	C5
<i>R519</i>	<i>B3</i>	5.00K .1 %T 9	202-5001-00	TEMPERATURES	5	3.4	3.2	C7
R520	B7	59.0K .02%T10	205-0023-00	TEMPERATURES	5	7.5	3.1	C4
R521	B7	3.32K .02%T10	205-0024-00	TEMPERATURES	5	7.5	3.8	C4
R522	B6	4.75K	201-4751-00	TEMPERATURES	5	12.6	5.6	B2
R523	B7	6.81K .02%T10	205-0025-00	TEMPERATURES	5	7.5	4.5	C4
R602	B3	2.21K	201-2211-00	OPTO COUPLERS	12	7.9	7.2	A4
R604	C3	47.5K	201-4752-00	OPTO COUPLERS	12	2.4	2.4	C7
R606	B3	47.5K	201-4752-00	OPTO COUPLERS	12	11.6	6.4	B2
R607	C3	2.55K	201-2551-00	OPTO COUPLERS	12	6.2	2.4	D5
R608	C3	10.0K	201-1002-00	OPTO COUPLERS	12	7.5	7.2	A5
R610	B3	2.55K	201-2551-00	OPTO COUPLERS	12	9.8	5.5	B3
R611	B5	22.1K	201-2212-00	POWER SUPPLY	11	11.3	4.2	C2
R612	B5	22.1K	201-2212-00	POWER SUPPLY	11	11.3	5.0	B2
R613	C4	3.32K0.5%	209-3321-00	POWER SUPPLY	11	3.6	5.4	B7
R614	C4	10.0K0.5%	209-1002-00	POWER SUPPLY	11	2.8	5.4	B7
R615	C5	100K	201-1003-00	POWER SUPPLY	11	2.0	0.4	D7
<i>R616</i>	<i>C5</i>	100K	201-1003-00	POWER SUPPLY	11	2.0	1.0	D7
R618	C5	162K	201-1623-00	POWER SUPPLY	11	4.3	1.1	D6
<i>R619</i>	<i>C4</i>	100K	201-1003-00	POWER SUPPLY	11	4.3	2.0	D6
R620	C5	100K	201-1003-00	POWER SUPPLY	11	2.2	4.1	C7
R621	C5	100K	201-1003-00	POWER SUPPLY	11	2.2	3.2	C7
R622	C4	274 OHM	201-2740-00	POWER SUPPLY	11	3.9	4.4	C6
R623	B5	47.5K	201-4752-00	POWER SUPPLY	11	12.8	5.0	B2

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R624	A5	47.5K	201-4752-00	POWER SUPPLY	11	12.8	7.0	B2
R626	C5	49.9 OHM	201-499Z-00	POWER SUPPLY	11	2.8	1.3	D7
R627	C5	1.00M	201-1004-00	POWER SUPPLY	11	0.8	3.6	C8
R628	C5	1.00M	201-1004-00	POWER SUPPLY	11	0.8	2.6	C8
R629	C5	82.5 OHM	201-825Z-00	POWER SUPPLY	11	1.4	3.6	C8
R630	C5	100K	201-1003-00	POWER SUPPLY	11	1.7	2.6	C8
R633	C5	82.5 OHM	201-825Z-00	POWER SUPPLY	11	1.2	0.5	D8
R635	C5	1.00K	201-1001-00	POWER SUPPLY	11	3.1	2.1	D7
R639	B5	82.5 OHM	201-825Z-00	POWER SUPPLY	11	9.5	3.2	C3
R641	B5	82.5 OHM	201-825Z-00	POWER SUPPLY	11	9.5	7.7	A3
R650	C3	100K	201-1003-00	OPTO COUPLERS	1	3.9	3.5	C6
R660	A5	100K	201-1003-00	POWER SUPPLY	11	8.0	0.7	D4
R661	B5	100K	201-1003-00	POWER SUPPLY	11	8.8	0.9	D4
R662	B4	51.1K	201-5112-00	POWER SUPPLY	11	11.8	5.0	B2
R663	B4	2.21K	201-2211-00	POWER SUPPLY	11	11.8	2.6	C2
R664	B4	2.21K	201-2211-00	POWER SUPPLY	11	11.8	7.8	A2
R666	C5	DEPOP.		POWER SUPPLY	11	1.8	5.1	B8
R667	B5	511 OHM	201-5110-00	POWER SUPPLY	11	8.2	7.2	A4
R668	C4	22.1K	201-2212-00	POWER SUPPLY	11	5.1	1.7	D6
R669	B5	2.2M	203-2204-00	POWER SUPPLY	11	10.6	5.0	B3
R680	B3	1.69K	201-1691-00	OPTO COUPLERS	1	8.5	3.8	C4
R681	B3	47.5K	201-4752-00	OPTO COUPLERS	1	10.9	3.8	C3
R682	C3	1.50K	201-1501-00	OPTO COUPLERS	1	6.8	6.5	B5
R683	C3	47.5K	201-4752-00	OPTO COUPLERS	1	5.2	5.9	B6
R704	C2	33.2K	201-3322-00	DISPLAY CONTROL CPU	7	11.5	1.9	D2
R709	D5	10.0K	201-1002-00	DISPLAY CONTROL CPU	7	3.4	8.7	A7
R710	D5	332K	201-3323-00	DISPLAY CONTROL CPU	7	4.7	7.8	A6
R711	C7	47.5K	201-4752-00	DISPLAY CONTROL CPU	7	14.1	1.0	D1
R712	D7	47.5K	201-4752-00	DISPLAY CONTROL CPU	7	3.0	1.2	D7
R714	C2	47.5K	201-4752-00	DISPLAY CONTROL CPU	7	11.5	1.6	D2
R716	C3	47.5K	201-4752-00	DISPLAY CONTROL CPU	7	11.5	0.6	D2
R720	C2	47.5K	201-4752-00	DISPLAY CONTROL CPU	7	11.4	1.1	D2
R801	C8	22.1K	201-2212-00	DISPLAY CONTROLLER	8	6.1	4.3	C5
R802	C7	332K	201-3323-00	DISPLAY CONTROLLER	8	6.6	4.5	C5
R803	C7	162K	201-1623-00	DISPLAY CONTROLLER	8	7.2	4.5	C5
R804	C7	82.5K	201-8252-00	DISPLAY CONTROLLER	8	7.8	4.5	C4
R805	C8	39.2K	201-3922-00	DISPLAY CONTROLLER	8	8.4	4.5	C4
R806	D8	20.0K	201-2002-00	DISPLAY CONTROLLER	8	9.3	4.0	C4
R808	C2	100K	201-1003-00	DISPLAY CONTROLLER	8	8.2	6.1	C4
R809	B1	1.00K	201-1001-00	DISPLAY CONTROLLER	8	9.5	7.8	A3
R810	B1	1.00K	201-1001-00	DISPLAY CONTROLLER	8	10.1	8.0	A3
R812	C3	22.1K	201-2212-00	DISPLAY CONTROLLER	8	12.7	5.5	B2

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R813	C3	22.1K	201-2212-00	DISPLAY CONTROLLER	8	13.4	4.2	C1
R814	C3	22.1K	201-2212-00	DISPLAY CONTROLLER	8	13.0	6.4	B2
R815	C3	22.1K	201-2212-00	DISPLAY CONTROLLER	8	13.9	5.3	B1
R818	A2	1.00K	201-1001-00	DISPLAY CONTROL CPU	7	9.6	5.6	B3
R819	C7	1.00K	201-1001-00	DISPLAY CONTROLLER	8	2.8	5.0	B7
R820	C7	1.00K	201-1001-00	DISPLAY CONTROLLER	8	4.6	4.8	B6
R824	C5	100K	201-1003-00	DISPLAY CONTROLLER	8	13.1	2.8	C2
R825	C4	100K	201-1003-00	DISPLAY CONTROLLER	8	13.1	3.7	C2
R826	B4	100K	201-1003-00	DISPLAY CONTROLLER	8	12.3	4.1	C2
R827	C4	1.00K	201-1001-00	DISPLAY CONTROLLER	8	12.3	3.3	C2
R840	C7	0 OHM	201-0000-00	DISPLAY CONTROLLER	8	6.0	2.8	C5
R841	C7	DEPOP.		DISPLAY CONTROLLER	8	5.7	2.4	D5
R842	C7	DEPOP.		DISPLAY CONTROLLER	8	5.5	2.5	C6
R843	C5	10.0K	201-1002-00	DISPLAY CONTROLLER	8	5.6	8.7	A6
R902	A7	10.0K	201-1002-00	ANALOG OUTPUT/SPKR	9	6.2	3.9	C5
R903	A8	1.00K	201-1001-00	ANALOG OUTPUT/SPKR	9	13.1	0.2	D1
R904	A1	1.00K	201-1001-00	ANALOG OUTPUT/SPKR	9	13.2	4.3	C1
R905	A8	2.21K	201-2211-00	ANALOG OUTPUT/SPKR	9	10.2	1.0	D3
R906	A7	2.21K	201-2211-00	ANALOG OUTPUT/SPKR	9	10.6	4.3	C3
R907	A7	162K	201-1623-00	ANALOG OUTPUT/SPKR	9	7.6	5.0	B4
R908	A8	27.4K	201-2742-00	ANALOG OUTPUT/SPKR	9	7.6	5.7	B4
R918	A8	6.34K	201-6341-00	ANALOG OUTPUT/SPKR	9	8.0	6.9	B4
R919	A8	100K	201-1003-00	ANALOG OUTPUT/SPKR	9	8.5	6.5	B4
R920	A8	10.0M	203-1005-00	ANALOG OUTPUT/SPKR	9	10.9	6.4	B3
R926	C4	221K	201-2213-00	ANALOG OUTPUT/SPKR	9	4.5	3.3	C6
R927	D3	22.1K	201-2212-00	ANALOG OUTPUT/SPKR	9	2.5	4.1	C7
R928	A7	162K	201-1623-00	ANALOG OUTPUT/SPKR	9	10.8	1.4	D3
R929	A7	332K	201-3323-00	ANALOG OUTPUT/SPKR	9	10.2	2.3	D3
R930	A7	100K	201-1003-00	ANALOG OUTPUT/SPKR	9	12.8	2.4	C2
R931	A7	20.0K	201-2002-00	ANALOG OUTPUT/SPKR	9	12.8	3.1	C2
R932	C4	511 OHM	201-5110-00	ANALOG OUTPUT/SPKR	9	5.4	5.7	B6
R933	C4	2.55K	201-2551-00	ANALOG OUTPUT/SPKR	9	5.4	6.5	B6
R934	C4	1.00K	201-1001-00	ANALOG OUTPUT/SPKR	9	2.8	5.8	B7
R935	C4	22.1K	201-2212-00	ANALOG OUTPUT/SPKR	9	2.3	6.5	B7
R936	C4	1.00K	201-1001-00	ANALOG OUTPUT/SPKR	9	2.9	7.0	B7
R937	C3	22.1K	201-2212-00	ANALOG OUTPUT/SPKR	9	2.3	7.5	A7
R938	C3	1.00K	201-1001-00	ANALOG OUTPUT/SPKR	9	3.4	8.4	A7
R939	B7	100 OHM	201-1000-00	ANALOG OUTPUT/SPKR	9	13.3	1.2	D1
R940	C8	100 OHM	201-1000-00	ANALOG OUTPUT/SPKR	9	10.8	3.3	C3
R1002	A7	100K	201-1003-00	DATA ACQUISITION CPU	6	7.7	5.5	B4
R1003	A6	4.75K	201-4751-00	DATA ACQUISITION CPU	6	0.9	5.3	B8
R1005	A6	4.75K	201-4751-00	DATA ACQUISITION CPU	6	0.9	5.9	B8

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
R1008	A5	4.75K	201-4751-00	DATA ACQUISITION CPU	6	1.0	6.9	B8
R1009	A5	4.75K	201-4751-00	DATA ACQUISITION CPU	6	1.0	7.1	A8
R1012	B4	100K	201-1003-00	DATA ACQUISITION CPU	6	1.6	3.4	C8
R1013	B5	100K	201-1003-00	DATA ACQUISITION CPU	6	2.2	3.4	C7
R1020	A5	DEPOP		DATA ACQUISITION CPU	6	14.2	2.5	C1
R1021	A5	0 OHM	201-0000-00	DATA ACQUISITION CPU	6	14.0	2.7	C1
R1022	A5	DEPOP		DATA ACQUISITION CPU	6	14.2	3.3	C1
R1101	D8	47.5K	201-4752-00	RS-423/DEFIB SYNC	10	8.6	4.6	C4
R1102	D7	47.5K	201-4752-00	RS-423/DEFIB SYNC	10	6.4	4.6	C5
R1103	C7	100K	201-1003-00	RS-423/DEFIB SYNC	10	5.7	5.0	B5
R1105	C4	511 OHM	201-5110-00	RS-423/DEFIB SYNC	10	10.6	8.2	A3
R1106	D7	162K	201-1623-00	RS-423/DEFIB SYNC	10	9.2	0.8	D4
R1107	D7	162K	201-1623-00	RS-423/DEFIB SYNC	10	10.1	0.8	D3
R1108	D7	511 OHM	201-5110-00	RS-423/DEFIB SYNC	10	10.6	1.1	D3
R1109	D7	16.5K	201-1652-00	RS-423/DEFIB SYNC	10	8.3	2.3	D4
R1110	D7	16.5K	201-1652-00	RS-423/DEFIB SYNC	10	9.7	2.6	C3
R1114	B4	511 OHM	201-5110-00	RS-423/DEFIB SYNC	10	10.6	6.8	B3
R1115	D8	274 OHM	201-2740-00	RS-423/DEFIB SYNC	10	12.7	0.8	D2
R1116	A7	274 OHM	201-2740-00	ANALOG OUTPUT/SPKR	9	13.6	2.0	D1
R1130	D8	82.5 OHM	201-825Z-00	RS-423/DEFIB SYNC	10	8.7	5.5	B4
R1131	D7	100K	201-1003-00	RS-423/DEFIB SYNC	10	7.5	1.4	D4
R1132	B4	34.0K	201-3402-00	RS-423/DEFIB SYNC	10	6.3	8.6	A5
R1133	C4	68.1K	201-6812-00	RS-423/DEFIB SYNC	10	6.6	6.4	B5
R1134	C4	68.1K	201-6812-00	RS-423/DEFIB SYNC	10	7.6	8.6	A4
R1150	B4	47.5K	201-4752-00	RS-423/DEFIB SYNC	10	11.6	2.8	C2
R1151	B5	56.2K	201-5622-00	RS-423/DEFIB SYNC	10	2.3	0.8	D7
R1152	B4	12.7K	201-1272-00	RS-423/DEFIB SYNC	10	3.4	1.1	D7
R1153	C5	47.5K	201-4752-00	RS-423/DEFIB SYNC	10	2.7	1.5	D7
R1154	C5	47.5K	201-4752-00	RS-423/DEFIB SYNC	10	1.5	1.3	D8
R1155	B8	12.7K	201-1272-00	RS-423/DEFIB SYNC	10	2.3	2.9	C7
R1156	B7	22.1K	201-2212-00	RS-423/DEFIB SYNC	10	4.4	3.1	C6
R1157	C4	511 OHM	201-5110-00	RS-423/DEFIB SYNC	10	10.6	7.9	A3
S706	C5	PLCC SKT	610-0006-00	DISPLAY CONTROL CPU	7	10.1	4.3	C3
S1003	B3	PLCC SKT	610-0006-00	DATA ACQUISITION CPU	6	10.4	2.0	D3
SG600	D6	SPARK GAP	-	POWER SUPPLY	11	6.1	8.5	A5
SW700	D2	NO	-	DISPLAY CONTROL CPU	7	0.9	4.5	C8
SW701	D4	NO	-	DISPLAY CONTROL CPU	7	0.9	4.7	B8
SW702	D5	NO	-	DISPLAY CONTROL CPU	7	0.9	4.9	B8
SW703	D6	NO	-	DISPLAY CONTROL CPU	7	0.9	5.1	B8
SW704	D7	NO	-	DISPLAY CONTROL CPU	7	0.9	5.3	B8
TP200	A6	VECG	-	ECG CHANNEL	2	13.0	4.9	B2
TP400	A6	TURRET	503-0022-00	NIBP	4	14.5	4.7	B1

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
TP401	A6	VPRS	-	NIBP	4	13.4	0.9	D1
TP402	A6	TURRET	503-0022-00	NIBP	4	1.2	4.5	C8
TP600	A2	VCC	-	POWER SUPPLY	11	1.2	5.9	B8
TP601	A1	TURRET	503-0022-00	POWER SUPPLY	11	2.5	6.6	B7
TP602	B1	-V SUP	-	ANALOG OUTPUT/SPKR	9	11.3	3.2	C2
TP603	A5	+VD	-	POWER SUPPLY	11	13.0	2.6	C2
TP604	A5	+VR	-	POWER SUPPLY	11	13.0	3.9	C2
TP605	A5	+VS	-	POWER SUPPLY	11	12.2	5.7	B2
TP606	A5	TURRET	503-0022-00	POWER SUPPLY	11	11.6	5.6	B2
TP607	A5	-VS	-	POWER SUPPLY	11	12.2	6.2	B2
TP608	A5	-VR	-	POWER SUPPLY	11	9.9	7.2	A3
TP609	A5	-VD	-	POWER SUPPLY	11	12.8	7.8	A2
TP610	A3	TURRET	503-0022-00	POWER SUPPLY	11	12.4	7.5	A2
TP611	A6	IAG	-	<<HIERARCHY>>	1	0.9	9.1	A8
TP621	C4	V15+	-	POWER SUPPLY	11	2.7	4.8	C7
TP622	C2	TURRET	503-0022-00	POWER SUPPLY	11	3.1	6.6	B7
TP699	B8	EMI_NULL	-	POWER SUPPLY	11	6.8	0.8	D5
TP700	D5	TURRET	503-0022-00	DISPLAY CONTROL CPU	7	5.4	6.6	B6
TP701	C3	TURRET	503-0022-00	DISPLAY CONTROL CPU	7	0.4	7.6	A8
TP800	C4	TURRET	503-0022-00	DISPLAY CONTROLLER	8	7.3	8.4	A5
TP901	B2	-2.5V REF	-	ANALOG OUTPUT/SPKR	9	8.1	2.9	C4
TP1000	A3	TURRET	503-0022-00	DATA ACQUISITION CPU	6	6.9	3.8	C5
TP1001	B3	TURRET	503-0022-00	DATA ACQUISITION CPU	6	1.4	1.8	D8
T601	B4	XFORMER	360-0008-00	POWER SUPPLY	11	6.4	5.1	B5
U200	C8	4052B	482-4052-03	ECG CIRCUITS	2	5.7	0.3	D5
U201	C7	4052B	482-4052-03	ECG CIRCUITS	2	5.7	2.5	C5
U203A	C8	TL064B	470-0002-03	ECG CIRCUITS	2	8.4	2.1	C4
U203B	C8	TL064B	470-0002-03	ECG CIRCUITS	2	9.1	3.7	C4
U203C	C8	TL064B	470-0002-03	ECG CIRCUITS	2	11.3	1.4	D2
U203D	C8	TL064B	470-0002-03	ECG CIRCUITS	2	8.4	0.4	D4
U204A	B8	TLC27M4A	470-0003-03	ECG CIRCUITS	2	3.2	5.7	B7
U204B	B8	TLC27M4A	470-0003-03	ECG CIRCUITS	2	4.7	6.6	B6
U204C	B8	TLC27M4A	470-0003-03	ECG CIRCUITS	2	7.6	4.9	B4
U204D	B8	TLC27M4A	470-0003-03	ECG CIRCUITS	2	13.9	3.3	C1
U205A	C7	TLC27M4A	470-0003-03	ECG CIRCUITS	2	11.4	6.9	B2
U205B	C7	TLC27M4A	470-0003-03	ECG CIRCUITS	2	9.3	6.9	B4
U205C	C7	TLC27M4A	470-0003-03	INVASIVE CHANNEL	3	8.1	7.1	A4
U205D	C7	TLC27M4A	470-0003-03	INVASIVE CHANNEL	3	8.1	5.5	B4
U300A	B7	74HC4016	483-4016-03	INVASIVE CHANNEL	3	12.9	7.1	A2
U300B	B7	74HC4016	483-4016-03	ECG CIRCUITS	2	6.4	6.5	B5
U300C	B7	74HC4016	483-4016-03	NIBP	4	4.6	7.0	A6
U300D	B7	74HC4016	483-4016-03	NIBP	4	1.6	6.2	B8

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Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
U301A	B8	TL064B	470-0002-03	INVASIVE CHANNEL	3	3.0	0.5	D7
U301B	B8	TL064B	470-0002-03	INVASIVE CHANNEL	3	3.4	2.8	C7
U301C	B8	TL064B	470-0002-03	INVASIVE CHANNEL	3	10.0	0.5	D3
U301D	B8	TL064B	470-0002-03	INVASIVE CHANNEL	3	11.5	3.0	C2
U302	C7	4053B	482-4053-03	INVASIVE CHANNEL	3	5.6	5.5	B5
U303A	B7	TL064B	470-0002-03	INVASIVE CHANNEL	3	11.4	6.3	B2
U303B	B7	TL064B	470-0002-03	TEMPERATURES	5	11.4	5.5	B2
U303C	B7	TL064B	470-0002-03	DATA ACQUISITION CPU	6	6.2	7.3	A5
U303D	B7	TL064B	470-0002-03	DATA ACQUISITION CPU	6	6.2	5.1	B5
U304A	B7	74HC4016	483-4016-03	INVASIVE CHANNEL	3	1.8	1.2	D7
U304B	B7	74HC4016	483-4016-03	NIBP	4	0.8	1.7	D8
a U304C	B7	74HC4016	483-4016-03	INVASIVE CHANNEL	3	8.9	8.4	A4
b U304C	B7	74HC4016	483-4016-03	ECG CIRCUITS	2	7.1	6.9	A5
U304D	B7	74HC4016	483-4016-03	INVASIVE CHANNEL	3	9.8	3.1	C3
U401A	B7	TLC27L4A	470-0001-03	NIBP	4	2.8	1.2	D7
U401B	B7	TLC27L4A	470-0001-03	NIBP	4	2.8	2.8	C7
U401C	B7	TLC27L4A	470-0001-03	NIBP	4	11.1	5.1	B3
U401D	B7	TLC27L4A	470-0001-03	NIBP	4	12.7	2.3	D2
U402A	A7	TLC27L9	470-0014-03	NIBP	4	8.2	5.8	B4
U402B	A7	TLC27L9	470-0014-03	NIBP	4	4.9	5.8	B6
U402C	A7	TLC27L9	470-0014-03	NIBP	4	9.4	2.1	D3
U402D	A7	TLC27L9	470-0014-03	NIBP	4	7.5	1.6	D5
U501	B6	4051B	482-4051-03	TEMPERATURES	5	11.1	1.0	D3
U602	C4	LT1070	474-0002-04	POWER SUPPLY	11	4.2	3.1	C6
U603	B5	LP2951	472-0001-03	POWER SUPPLY	11	9.2	3.9	C4
U604A	B5	TL064B	470-0002-03	POWER SUPPLY	11	10.7	6.6	B3
U604B	B5	TL064B	470-0002-03	POWER SUPPLY	11	10.5	7.6	A3
U604C	B5	TL064B	470-0002-03	POWER SUPPLY	11	10.6	3.1	C3
U604D	B5	TL064B	470-0002-03	POWER SUPPLY	11	8.8	0.4	D4
U605A	C3	74HC08	400-0008-03	ANALOG OUTPUT/SPKR	9	1.9	8.3	A8
U605B	C3	74HC08	400-0008-03	OPTO COUPLERS	12	2.1	4.3	C7
U605C	C3	74HC08	400-0008-03	OPTO COUPLERS	12	5.2	3.1	C6
U605D	C3	74HC08	400-0008-03	OPTO COUPLERS	12	2.2	6.8	B7
U606	C3	PS2501-1	322-0003-00	OPTO COUPLERS	12	7.6	7.9	A4
U607	C3	PC900V	322-0006-00	OPTO COUPLERS	12	7.1	3.0	C5
U608	C3	PC900V	322-0006-00	OPTO COUPLERS	12	7.5	5.8	B5
U700	D3	DUAL OSC.	502-0009-00	DISPLAY CONTROL CPU	7	0.5	0.9	D8
U703	D4	74HC4040	400-4040-03	DISPLAY CONTROL CPU	7	5.4	0.4	D6
U704	D5	80C31	440-8031-02	DISPLAY CONTROL CPU	7	4.1	2.8	C6
U705	D6	74HC373	400-0373-03	DISPLAY CONTROL CPU	7	7.1	2.8	C5
U706	C5	Prog. PROM	See Note	DISPLAY CONTROL CPU	7	9.3	2.8	C4

NOTE: Consult Protocol Systems, Inc. for P/N of latest ROM version and for compatibility requirement.

*Reference Designators and Assembly Drawing Locations shown in *ITALIC* and left justified are on the BACK of the board.

Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
U708A	C3	74HC14	400-0014-03	DISPLAY CONTROL CPU	7	2.2	7.2	A7
U708B	C3	74HC14	400-0014-03	DISPLAY CONTROL CPU	7	2.7	8.1	A7
U708C	C3	74HC14	400-0014-03	DISPLAY CONTROL CPU	7	5.4	2.2	D6
U708D	C3	74HC14	400-0014-03	DISPLAY CONTROL CPU	7	1.9	8.6	A8
U708E	C3	74HC14	400-0014-03	RS-423/DEFIB SYNC	10	5.7	0.3	D5
U708F	C3	74HC14	400-0014-03	RS-423/DEFIB SYNC	10	5.7	0.9	D5
U712	C4	74HC138	400-0138-03	DISPLAY CONTROL CPU	7	8.2	6.5	B4
U714	D2	82050	441-0002-02	DISPLAY CONTROL CPU	7	8.9	0.5	D4
U716	C6	58257LL	430-0005-03	DISPLAY CONTROL CPU	7	11.8	2.8	C2
U717	C6	DS1210S	441-0005-03	DISPLAY CONTROL CPU	7	11.7	5.5	B2
U720A	C6	74HC11	400-0011-03	DISPLAY CONTROL CPU	7	13.2	1.4	D1
U720B	C6	74HC11	400-0011-03	DISPLAY CONTROLLER	8	11.3	2.7	C2
U720C	C6	74HC11	400-0011-03	ANALOG OUTPUT/SPKR	9	1.6	6.9	B8
U800	B2	HD61830B	441-0001-03	DISPLAY CONTROLLER	8	3.2	0.2	D7
U801	C2	TC5565	430-0002-03	DISPLAY CONTROLLER	8	7.0	1.1	D5
U803	D4	74HCT377	400-T377-03	DISPLAY CONTROLLER	8	3.4	5.9	B7
U804A	C3	74HC123	400-0123-03	DISPLAY CONTROLLER	8	9.4	5.7	B3
U804B	C3	74HC123	400-0123-03	ANALOG OUTPUT/SPKR	9	9.8	8.2	A3
U805	D4	MSM6242	442-0001-03	DISPLAY CONTROLLER	8	3.5	7.4	A7
U806A	C3	74HC00	400-0000-03	OPTO COUPLERS	12	3.9	5.8	B6
U806B	C3	74HC00	400-0000-03	DISPLAY CONTROLLER	8	11.6	6.3	B2
U806C	C3	74HC00	400-0000-03	DISPLAY CONTROLLER	8	11.6	5.4	B2
U806D	C3	74HC00	400-0000-03	DISPLAY CONTROL CPU	7	11.7	7.5	A2
U807A	C2	74HC393	400-0393-03	DISPLAY CONTROLLER	8	5.5	4.8	B6
U807B	C2	74HC393	400-0393-03	DISPLAY CONTROLLER	8	1.2	3.4	C8
U810	C2	NMC93C46	433-0180-03	DISPLAY CONTROLLER	8	9.6	8.4	A3
U811A	D2	74HC393	400-0393-03	DISPLAY CONTROLLER	8	1.1	1.2	D8
U811B	D2	74HC393	400-0393-03	DISPLAY CONTROLLER	8	1.7	0.3	D8
U900	B2	AD7528	480-0001-02	ANALOG OUTPUT/SPKR	9	6.5	0.9	D5
U902A	A2	TLC27M4A	470-0003-03	ANALOG OUTPUT/SPKR	9	10.7	5.2	B3
U902B	A2	TLC27M4A	470-0003-03	ANALOG OUTPUT/SPKR	9	10.8	6.7	B3
U902C	A2	TLC27M4A	470-0003-03	ANALOG OUTPUT/SPKR	9	9.2	1.2	D4
U902D	A2	TLC27M4A	470-0003-03	ANALOG OUTPUT/SPKR	9	9.2	3.1	C4
U903	A2	TL431ACD	473-0003-03	ANALOG OUTPUT/SPKR	9	6.2	3.1	C5
U906	A2	TL031	470-0015-03	ANALOG OUTPUT/SPKR	9	11.6	1.9	D2
U1000	A3	80C31	440-8031-02	DATA ACQUISITION CPU	6	5.0	0.9	D6
U1002	A4	74HC373	400-0373-03	DATA ACQUISITION CPU	6	8.0	0.9	D4
U1003	B3	Prog. PROM	See Note	DATA ACQUISITION CPU	6	10.2	0.9	D3
NOTE: Consult Protocol Systems, Inc. for P/N of latest ROM version and for compatibility requirement.								
U1004	A4	TC5565	430-0002-03	DATA ACQUISITION CPU	6	12.7	0.9	D2
U1006	A5	74HCT377	400-T377-03	DATA ACQUISITION CPU	6	12.6	4.7	C2
U1007	A6	TLC1541	481-0001-02	DATA ACQUISITION CPU	6	5.9	5.9	B5

*Reference Designators and Assembly Drawing Locations shown in *ITALIC* and left justified are on the BACK of the board.

Reference Designator*	Assy. Dwg. Location*	Part Description	Protocol Part Number	Schematic Page Titles	Page #	X	Y	Schematic Grid
U1008A	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	7.7	5.0	B4
U1008B	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	2.3	5.5	B7
U1008C	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	3.0	5.5	B7
U1008D	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	3.8	5.5	B6
U1008E	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	4.6	5.5	B6
U1008F	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	5.4	5.5	B6
U1008G	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	2.1	4.9	B7
U1008H	A6	MMAD1108	306-0003-03	TEMPERATURES	5	13.3	5.3	B1
U1009A	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	7.7	7.7	A4
U1009B	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	2.1	7.1	A7
U1009C	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	2.8	7.1	A7
U1009D	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	3.6	7.1	A7
U1009E	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	4.4	7.1	A6
U1009F	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	5.2	7.1	A6
U1009G	A6	MMAD1108	306-0003-03	DATA ACQUISITION CPU	6	1.2	4.9	B8
U1009H	A6	MMAD1108	306-0003-03	TEMPERATURES	5	13.3	5.9	B1
U1010A	A3	74HC14	400-0014-03	DATA ACQUISITION CPU	6	2.1	1.0	D7
U1010B	A3	74HC14	400-0014-03	OPTO COUPLERS	12	12.4	4.3	C2
U1010C	A3	74HC14	400-0014-03	OPTO COUPLERS	12	9.8	4.3	C3
U1010D	A3	74HC14	400-0014-03	DATA ACQUISITION CPU	6	9.2	3.5	C4
U1010E	A3	74HC14	400-0014-03	DATA ACQUISITION CPU	6	11.9	7.6	A2
U1010F	A3	74HC14	400-0014-03	DATA ACQUISITION CPU	6	13.8	7.6	A1
U1101	D2	LT1032CS	442-0005-03	RS-423/DEFIB SYNC	10	4.2	4.0	C6
U1102	B6	LTC485CS8	442-0004-03	RS-423/DEFIB SYNC	10	4.6	6.6	B6
U1103	C5	LTC485CS8	442-0004-03	RS-423/DEFIB SYNC	10	4.6	8.0	A6
U1104A	D2	TL032	470-0011-03	RS-423/DEFIB SYNC	10	7.5	5.4	B4
U1104B	D2	TL032	470-0011-03	DISPLAY CONTROLLER	8	9.2	4.3	C4
X800	D4	32.768KHZ	502-0004-00	DISPLAY CONTROLLER	8	4.9	7.8	A6
X1000	A3	10.752MHZ	502-0005-00	DATA ACQUISITION CPU	6	3.8	1.2	D6

*Reference Designators and Assembly Drawing Locations shown in *ITALIC* and left justified are on the BACK of the board.



D 824-0197-00
 1 2 3
 1 2 3 4 5 6 7 8
 1 2 3 4 5 6 7 8

NOTES: PART NO. OF THIS ASSEMBLY IS 031-0018-XX.

- 1 MARK ASSEMBLY SUFFIX & REV. LEVEL OBTAINED FROM BOM, IN PERMANENT CONTRASTING INK ON TOP OF BOARD. DO NOT MARK IN ISOLATION BARRIER AREA.

- 2 PLACE BAR CODE LABEL VENDOR SERIAL NUMBER AS SHOWN, ON BACKSIDE OF PCB UNDER U805.

PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QTY AND REV LEVEL NOT REQUIRED WITH DUPLICATE LABEL.

BAR CODE REQUIREMENTS:

- REV. LEVEL (NOT REQUIRED WITH DUPLICATE LABEL)
- QUANTITY (NOT REQUIRED WITH DUPLICATE LABEL)
- THREE DIGIT SERIAL NUMBER
- FOUR DIGIT LOT CODE NUMBER
- VENDOR I.D.

3. ASSEMBLE BOARD TO CURRENT REVISION BILL OF MATERIALS.

- 4 NO MARKING OR LABELS ALLOWED IN BARRIER AREA, BOTH SIDES.

- 5 LAY UP200, 201, 202, OVER TOP OF R201, 202, 204, 205, 207, 208.

- 6 PLACE BOARD ASSEMBLY IN ANTI-STATIC BAG WHEN COMPLETE.

- 7 S706 AND S1003 ARE SOCKET LOCATIONS.

- 8 X800 MUST HAVE FILLETS VISIBLE MINIMUM 3 CORNERS

- 9 MAXIMUM LEAD LENGTH ON SOLDER SIDE IS .060 INCH. EXCEPT AS NOTED.

- 10 MASK HOLES AS INDICATED; NO SOLDER ALLOWED (21 PLACES).

11. THE FOLLOWING COMPONENTS ARE SHOWN ON THE DRAWING, BUT ARE NOT INCLUDED IN THE BILL OF MATERIALS. THEY ARE TO REMAIN DEPOPULATED: C224, R666, R841, R842, C955, D902, R1020, R1022.

12. WORKMANSHIP SHALL MEET OR EXCEED THE "PREFERRED" OR "ACCEPTABLE" QUALITY LEVELS SPECIFIED BY IPC-A-610, CLASS 2. COMPLETED BOARD ASSEMBLY MUST PASS PROTOCOL SYSTEMS 4,000 VOLT, 60 HZ. HI-POT TEST. PERFORMED AT PROTOCOL SYSTEMS IN COMPLETED MONITOR.

13. THE DESIGNATOR FOR THIS DRAWING IS "CJ".

- 14 "●" INDICATES TEST TURRET INSTALLED HERE, 11 PLACES. "TPXXX"

- 15 C621 MUST BE MOUNTED TIGHT TO PCB.

- 16 LOAD C750, THEN LOAD OSCILLATOR, U700 OVER TOP OF CAP.

- 17 TRIM LEADS ON TP400, TP402, TP606, U606, U607, U608, & U700 FLUSH WITH SOLDER FILLET.

- 18 INSTALL TWO PIN JUMPER SHUNT, JP610, ON PINS 1&2 OF P10, THE 3 PIN HEADER.

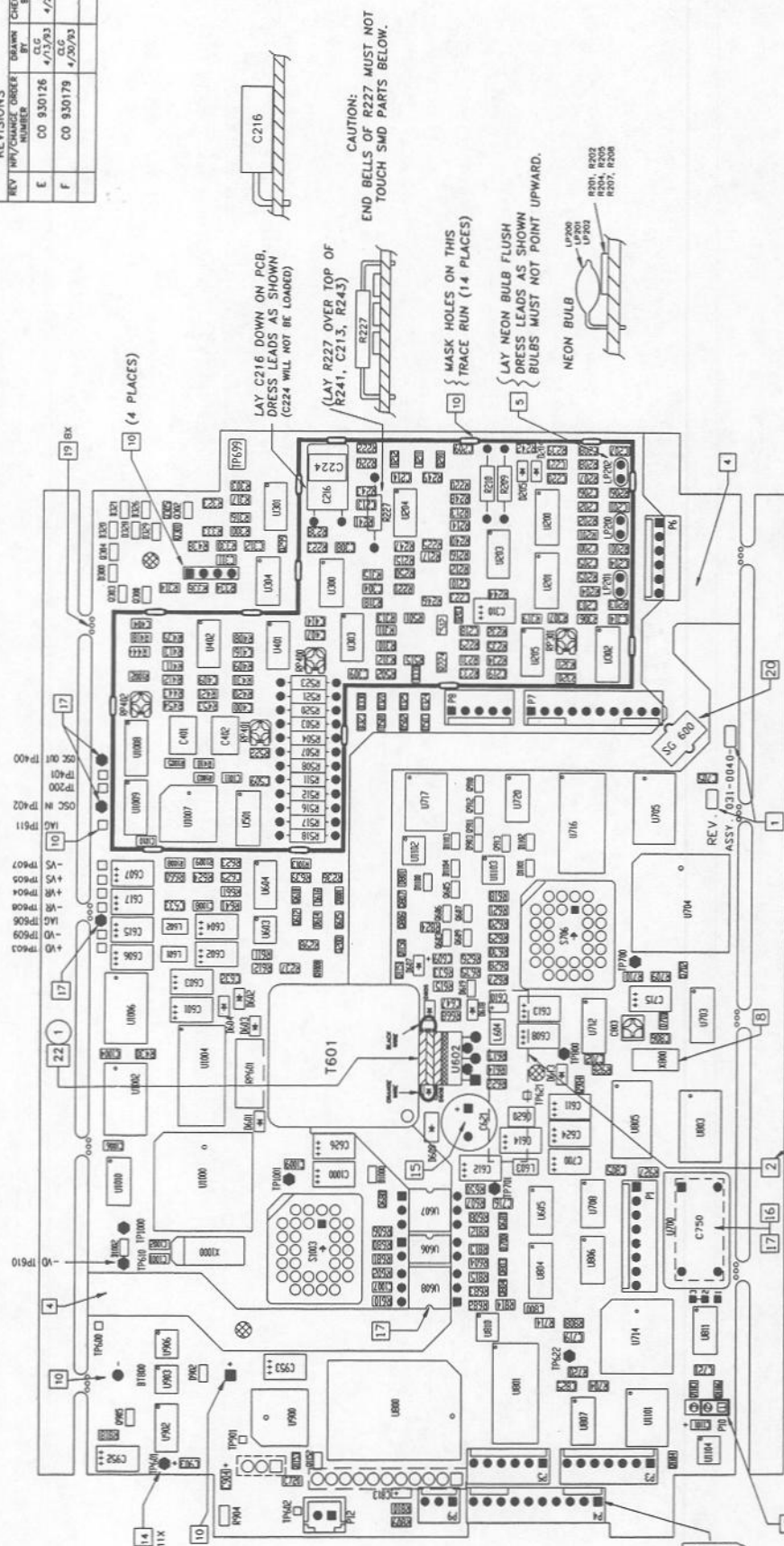
- 19 SHEAR OR ROUT EXTENSION TABS FROM COMPLETED ASSEMBLED BOARD ALONG HORIZONTAL EDGES TO WITHIN ±.015 INCH OF BOARD EDGE.

- 20 S6600 IS A ROUTED OUT FEATURE IN THE PCB.

- 21 INSTALL FOAM TAPE PER DETAIL A.

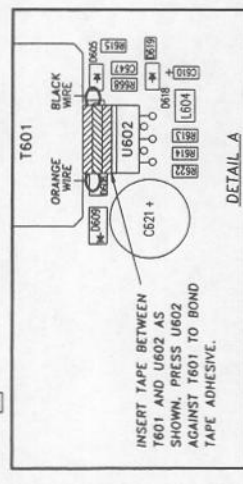
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DATE	824-0197-00	DATE	3 3 3
BY	824-0197-00	BY	3 3 3
CHKD	824-0197-00	CHKD	3 3 3
FILE	824-0197-00	FILE	3 3 3
SCALE	NONE	SCALE	NONE
SHEET	3	SHEET	3
DO NOT SCALE DRAWING		DO NOT SCALE DRAWING	

REVISIONS				
REV	MP/CHANGE ORDER NUMBER	DRAWN BY	CHECKED BY	
E	CO 930126	CLG 4/13/93	OK 4/28/93	
F	CO 930179	CLG 4/30/93		



NOTE:
SEE NOTES ON PAGE 3

PLACE LABEL TO READ 180° (OPPOSITE) FROM COPPER
ETCH PRINTING ON SOLDER SIDE OF BOARD



PROTOCOL
SYSTEMS, INC.

DATE: 8/1/81
BY: J. LAUGHON

PROJECT NO.: 100-100000
JOB NO.: 100-100000

DESCRIPTION: M. MAIN PCB, 1st LEVEL
ASSEMBLY DRAWING

DRAWN BY: J. SHELLE
CHECKED BY: J. SHELLE
DATE: 8/1/81

SCALE: NONE
SHEET 1 OF 3

DO NOT SCALE DRAWING

THE following data contains information which is the proprietary property of PROTOCOL SYSTEMS, INC. and is to be used for the purpose of this drawing only. It is to be held in confidence and is not to be distributed outside of the company without the written permission of PROTOCOL SYSTEMS, INC.

DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
XX = ±
YY = ±
ANGLES = ±

NOTES: PART NO. OF THIS ASSEMBLY IS 031-0040-XX.

1 MARK ASSEMBLY SUFFIX & REV. LEVEL OBTAINED FROM BOM, IN PERMANENT CONTRASTING INK ON TOP OF BOARD. DO NOT MARK IN ISOLATION BARRIER AREA.

2 PLACE BAR CODE LABEL WITH VENDOR SERIAL NUMBER ON BACK SIDE OF BOARD, AS SHOWN. PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QTY AND REV LEVEL NOT REQUIRED WITH DUPLICATE LABEL.

BAR CODE REQUIREMENTS:

- CODE 39
- REV. LEVEL (NOT REQUIRED WITH DUPLICATE LABEL)
- VENDOR I.D. (NOT REQUIRED WITH DUPLICATE LABEL)
- THREE DIGIT SERIAL NUMBER
- FOUR DIGIT LOT CODE NUMBER
- VENDOR I.D.

3. ASSEMBLE BOARD TO CURRENT REVISION BILL OF MATERIALS.

4 NO MARKING OR LABELS ALLOWED IN BARRIER AREA, BOTH SIDES.

5 LAY LP200, 201, 202, OVER TOP OF R201, 202, 204, 205, 207, 208.

6 PLACE BOARD ASSEMBLY IN ANTI-STATIC BAG WHEN COMPLETE.

7. S706 AND S1003 ARE SOCKET LOCATIONS.

8. X800 MUST HAVE FILLETS VISIBLE MINIMUM 3 CORNERS

9. MAXIMUM LEAD LENGTH ON SOLDER SIDE IS .060 INCH.

EXCEPT AS NOTED.

10 MASK HOLES AS INDICATED; NO SOLDER ALLOWED (21 PLACES).

11. THE FOLLOWING COMPONENTS ARE SHOWN ON THE DRAWING, BUT ARE NOT INCLUDED IN THE BILL OF MATERIALS. THEY ARE TO REMAIN DEPOPULATED:

C224, R666, R841, R842, C955, D902, R1020, R1022.

12. WORKMANSHIP SHALL MEET OR EXCEED THE "PREFERRED" OR "ACCEPTABLE" QUALITY LEVELS SPECIFIED BY IPC-A-610.

CLASS 2- COMPLETED BOARD ASSEMBLY MUST PASS PROTOCOL SYSTEMS 4000 VOLT, 60 HZ, HI-POT TEST PERFORMED AT PROTOCOL SYSTEMS IN COMPLETED MONITOR.

13. THE DESIGNATOR FOR THIS DRAWING IS "DY".

14. "●" INDICATES TEST TURRET INSTALLED HERE, 11 PLACES. "TPXXX"

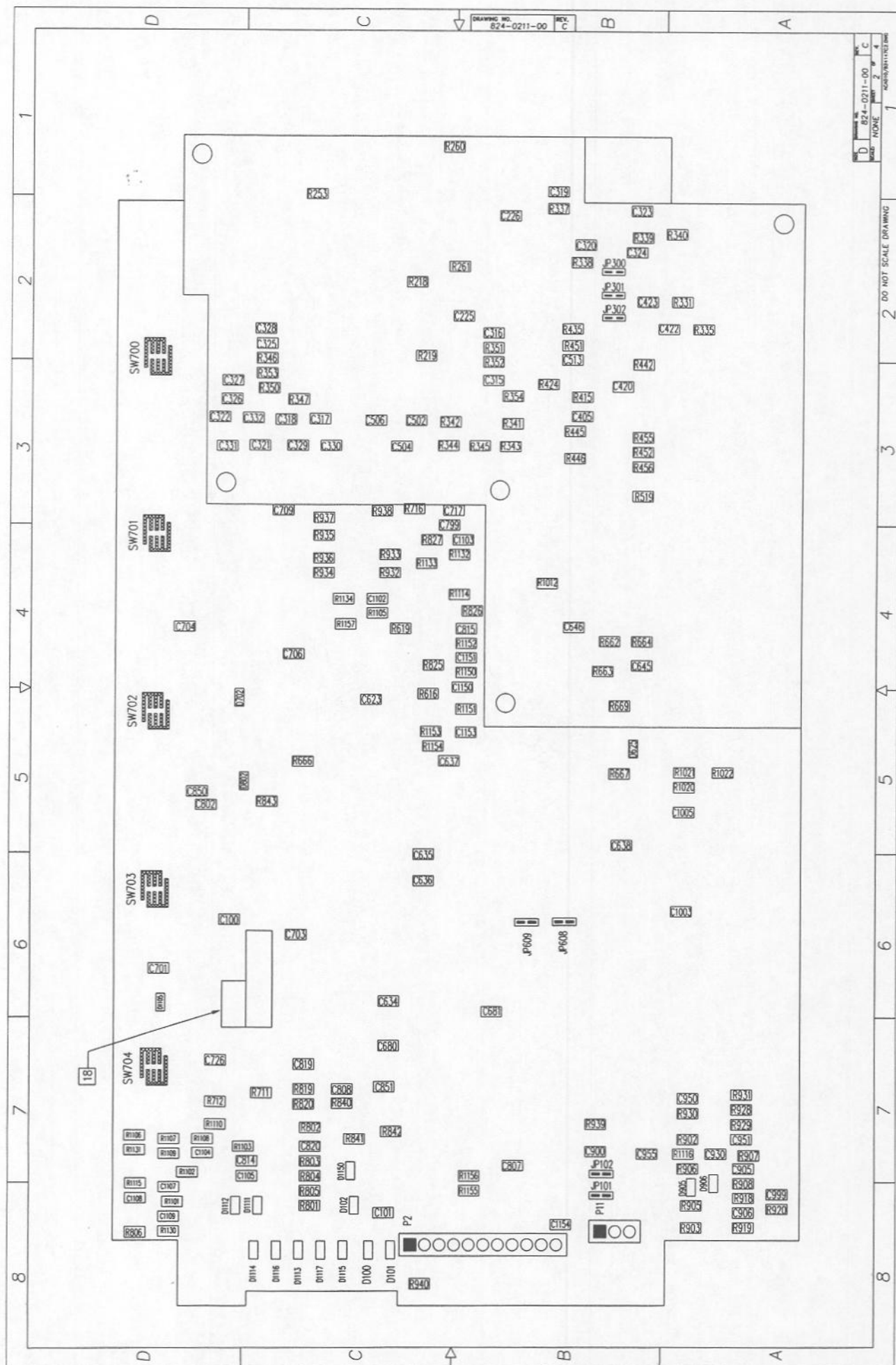
- 15. C621 MUST BE MOUNTED TIGHT TO PCB.
- 16. LOAD C750, THEN LOAD OSCILLATOR, U700 OVER TOP OF CAP.
- 17. TRIM LEADS ON TP400, TP402, TP606, U606, U607, U608, & U700 FLUSH WITH SOLDER FILLET.
- 18. INSTALL TWO PIN JUMPER SHUNT, JP610, ON PINS 1&2 OF P10, THE 3 PIN HEADER.
- 19. SHEAR OR ROUT EXTENSION TABS FROM COMPLETED ASSEMBLED BOARD ALONG HORIZONTAL EDGES TO WITHIN ±.015 INCH OF BOARD EDGE.

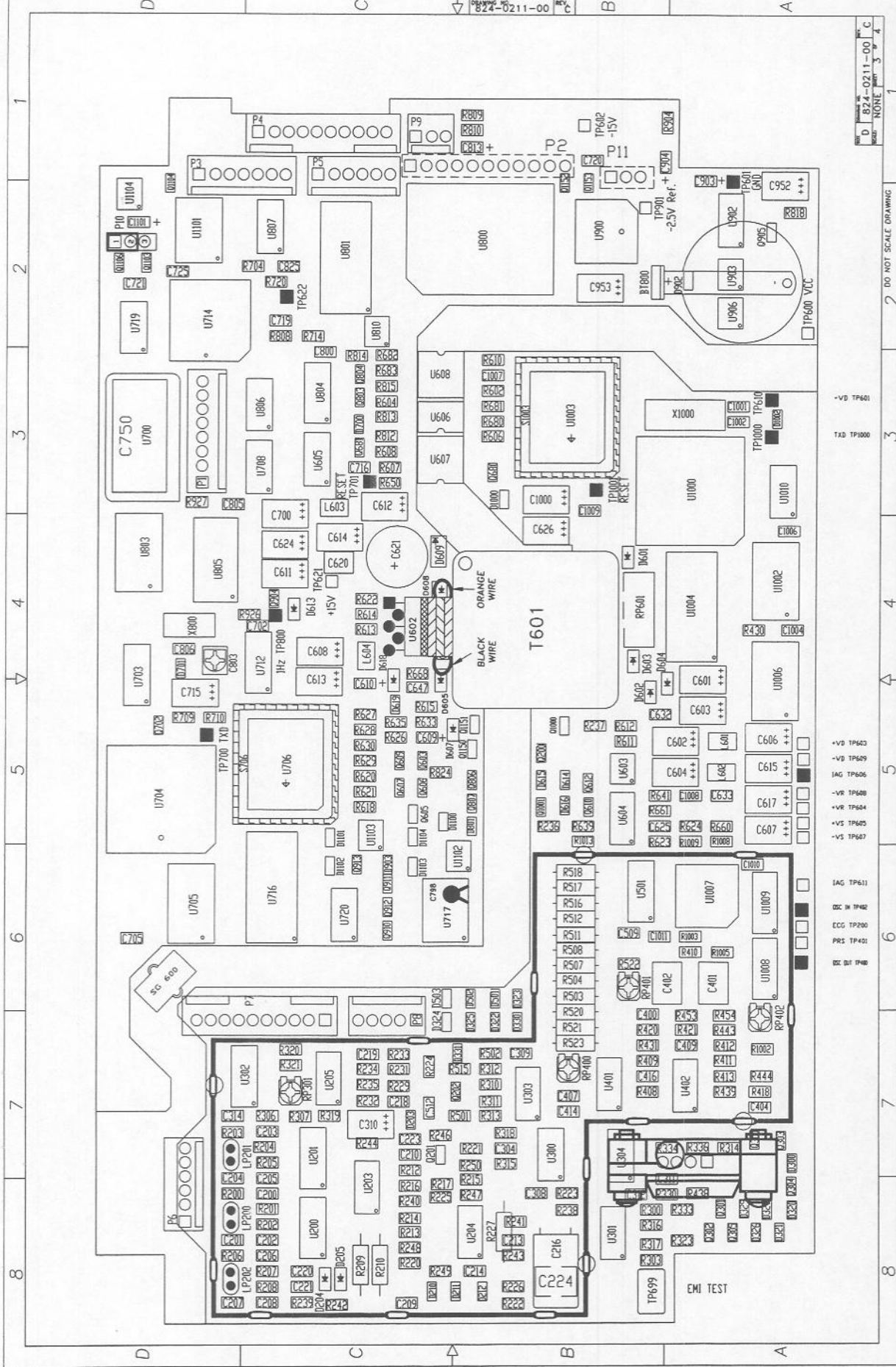
20. SG600 IS A ROUTED OUT FEATURE IN THE PCB.

21. DEFECT CRITERIA FOR ISOLATION ZONE:

IN THE ISOLATION ZONE, IN OR ON THE SOLDERMASK, ANY CONTAMINATION ≥ .015 INCH MAXIMUM DIMENSION IS NOT ALLOWED.

22. INSTALL FOAM TAPE PER DETAIL A.



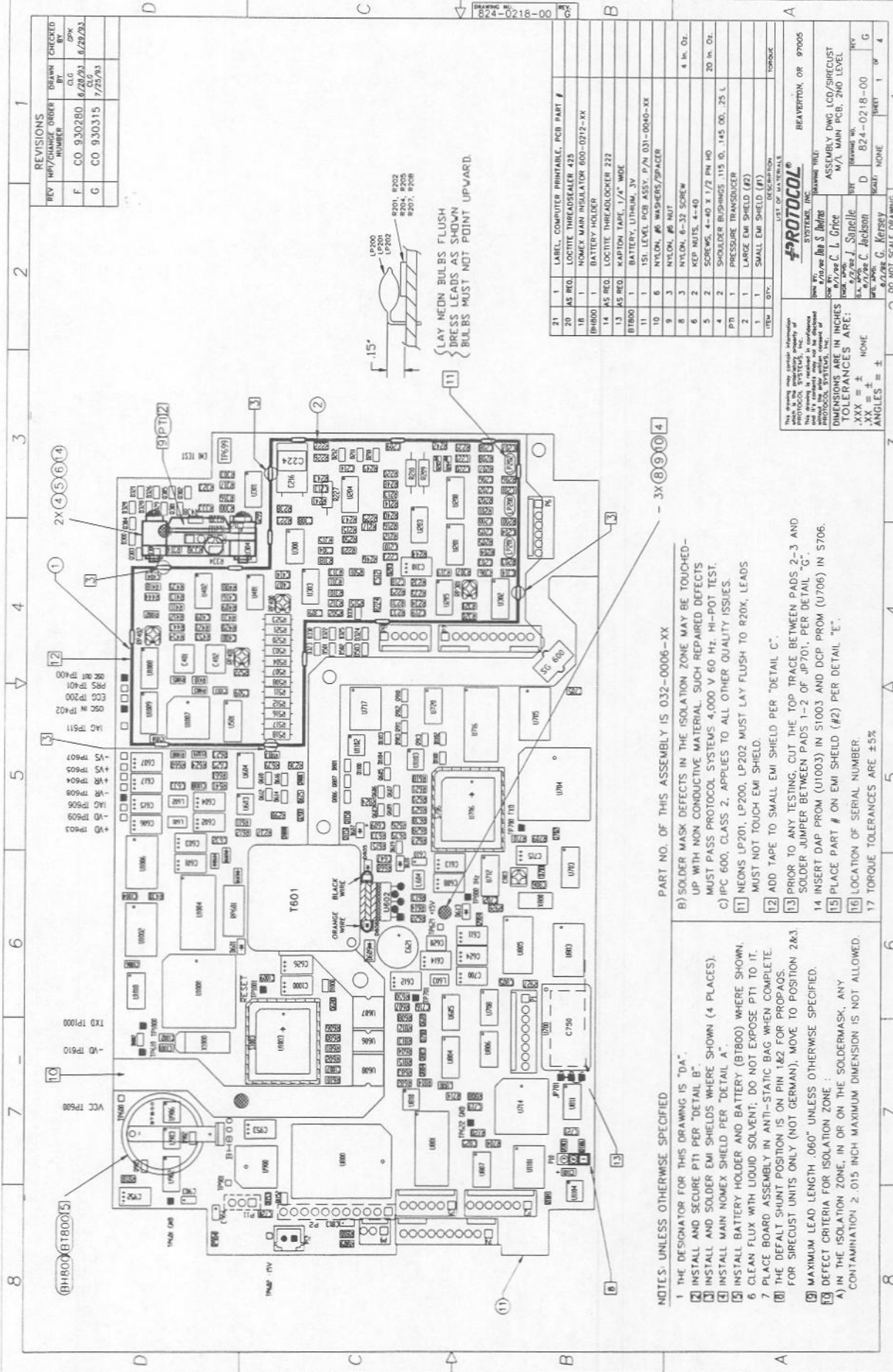


- +VD TP601
- TAD TP1000
- +VD TP603
- VD TP609
- IAG TP606
- VR TP608
- +VR TP604
- +VS TP605
- VS TP607
- IAG TP611
- DEC IN TP402
- ECG TP200
- PRS TP401
- DEC BIT TP40

824-0211-00
REV. 3
C
D
NONE

1 2 3 4 5 6 7 8

DO NOT SCALE DRAWING



NOTES: UNLESS OTHERWISE SPECIFIED

- 1 THE DESIGNATOR FOR THIS DRAWING IS "DA".
- 2 INSTALL AND SECURE PT1 PER "DETAIL B".
- 3 INSTALL AND SOLDER EMI SHIELDS WHERE SHOWN (4 PLACES).
- 4 INSTALL MAIN NEMEX SHIELD PER "DETAIL A".
- 5 INSTALL BATTERY HOLDER AND BATTERY (BT800) WHERE SHOWN.
- 6 CLEAN FLUX WITH LIQUID SOLVENT; DO NOT EXPOSE PT1 TO IT.
- 7 PLACE BOARD ASSEMBLY IN ANTI-STATIC BAG WHEN COMPLETE.
- 8 THE DEFAULT SHUNT POSITION IS ON PIN 182 FOR PROPOS.
- 9 FOR SPECIFIC UNITS ONLY (NOT GERMAN), MOVE TO POSITION 2&3.
- 10 MAXIMUM LEAD LENGTH .060" UNLESS OTHERWISE SPECIFIED.
- 11 DEFECT CRITERIA FOR ISOLATION ZONE:
 - A) IN THE ISOLATION ZONE, IN OR ON THE SOLDERMASK, ANY CONTAMINATION 2.015 INCH MAXIMUM DIMENSION IS NOT ALLOWED.

PART NO. OF THIS ASSEMBLY IS 032-0006-XX

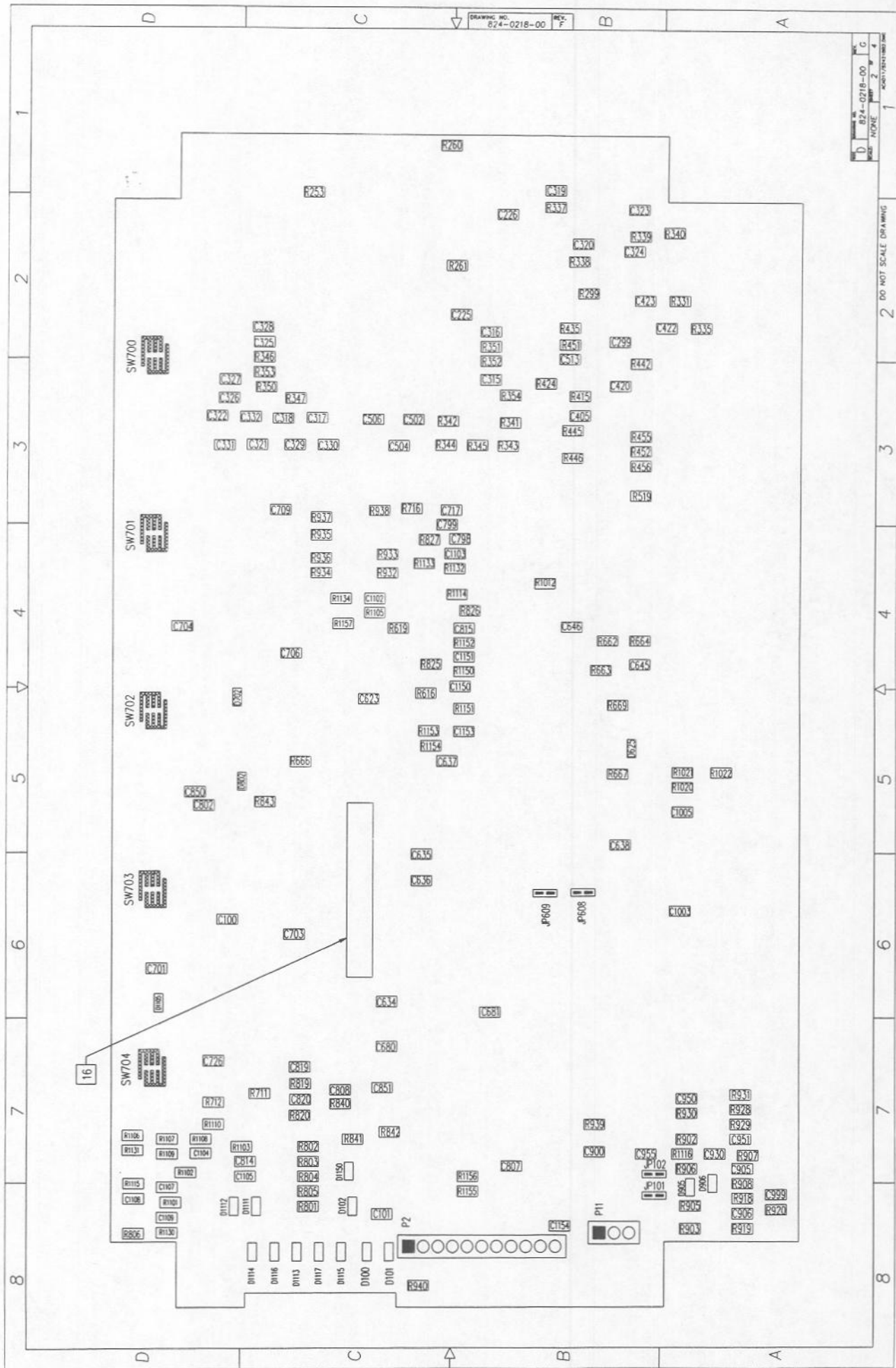
- B) SOLDER MASK DEFECTS IN THE ISOLATION ZONE MAY BE TOUCHED-UP WITH NON CONDUCTIVE MATERIAL, SUCH REPAIRED DEFECTS MUST PASS PROTOCOL SYSTEMS 4,000 V 60 HZ. HI-POT TEST.
- C) IPC 600, CLASS 2, APPLIES TO ALL OTHER QUALITY ISSUES.
- 11 NEONS LP201, LP200, LP202 MUST LAY FLUSH TO R20X, LEADS MUST NOT TOUCH EMI SHIELD.
- 12 ADD TAPE TO SMALL EMI SHIELD PER "DETAIL C".
- 13 PRIOR TO ANY TESTING, CUT THE TOP TRACE BETWEEN PADS 2-3 AND SOLDER JUMPER BETWEEN PADS 1-2 OF JP701, PER DETAIL "G".
- 14 INSERT DAP FROM (U1003) IN S1003 AND DCP FROM (U706) IN S706.
- 15 PLACE PART # ON EMI SHIELD (#2) PER DETAIL "E".
- 16 LOCATION OF SERIAL NUMBER.
- 17 TORQUE TOLERANCES ARE ±5%

REV	DESCRIPTION	DATE	BY	CHECKED	DATE
F	CO 930280	4/28/93	CLG	CLG	8/29/93
G	CO 930315	7/25/93	CLG	CLG	

REV	DESCRIPTION	DATE	BY	CHECKED	DATE
21	1 LABEL, COMPUTER PRINTABLE, PCB PART #				
20	AS REQ. LOCITE THREADLOCKER 425				
18	1 NEMEX MAIN INSULATOR 600-0212-XX				
17	1 BATTERY HOLDER				
14	AS REQ. LOCITE THREADLOCKER 222				
13	AS REQ. KAPTON TAPE, 1/4" WIDE				
12	1 BATTERY, LITHIUM, 3V				
11	1 151. LEVEL PCB ASSY. P/N 031-0040-XX				
10	6 NYLON, #6 WASHERS/PACER				
9	3 NYLON, #6 NUT				
8	3 NYLON, 6-32 SCREW				
6	2 KEP NUTS, 4-40				
5	2 SCREWS, 4-40 X 1/2 IN. #0				
4	2 SHOULDER BUSHINGS, 115 0, 145 00, 25 L				
3	1 PRESSURE TRANSDUCER				
2	1 LARGE EMI SHIELD (#2)				
1	1 SMALL EMI SHIELD (#1)				
100%					

REV	DESCRIPTION	DATE	BY	CHECKED	DATE
21	1 LABEL, COMPUTER PRINTABLE, PCB PART #				
20	AS REQ. LOCITE THREADLOCKER 425				
18	1 NEMEX MAIN INSULATOR 600-0212-XX				
17	1 BATTERY HOLDER				
14	AS REQ. LOCITE THREADLOCKER 222				
13	AS REQ. KAPTON TAPE, 1/4" WIDE				
12	1 BATTERY, LITHIUM, 3V				
11	1 151. LEVEL PCB ASSY. P/N 031-0040-XX				
10	6 NYLON, #6 WASHERS/PACER				
9	3 NYLON, #6 NUT				
8	3 NYLON, 6-32 SCREW				
6	2 KEP NUTS, 4-40				
5	2 SCREWS, 4-40 X 1/2 IN. #0				
4	2 SHOULDER BUSHINGS, 115 0, 145 00, 25 L				
3	1 PRESSURE TRANSDUCER				
2	1 LARGE EMI SHIELD (#2)				
1	1 SMALL EMI SHIELD (#1)				
100%					

PROTOCOL SYSTEMS, INC.
 10000 S. 10TH AVE.
 SUITE 100
 BEAVERTON, OR 97005
 (503) 766-1111
 FAX (503) 766-1112
 E-MAIL: PROTOCOL@PROTOCOL.COM
 WWW: WWW.PROTOCOL.COM
 DIMENSIONS ARE IN INCHES
 TOLERANCES ARE:
 .XXX = ±
 .XX = ±
 .X = ±
 ANGLES = ±



D 824-0218-00 G
PAGE NONE SHEET 2 OF 4
1 2 3 4 5 6 7 8

2 DO NOT SCALE DRAWING

3

4

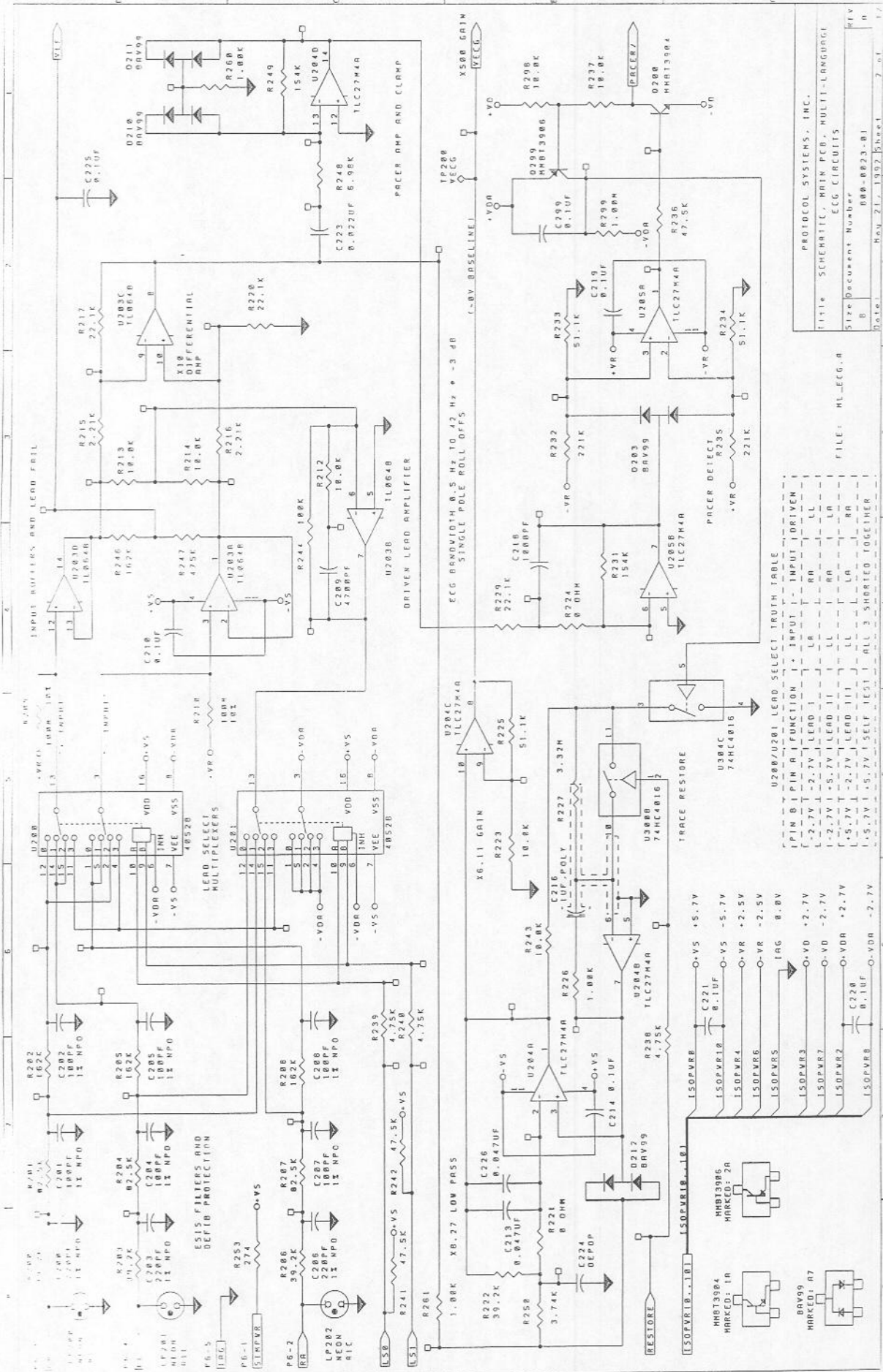
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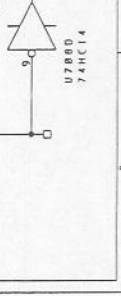


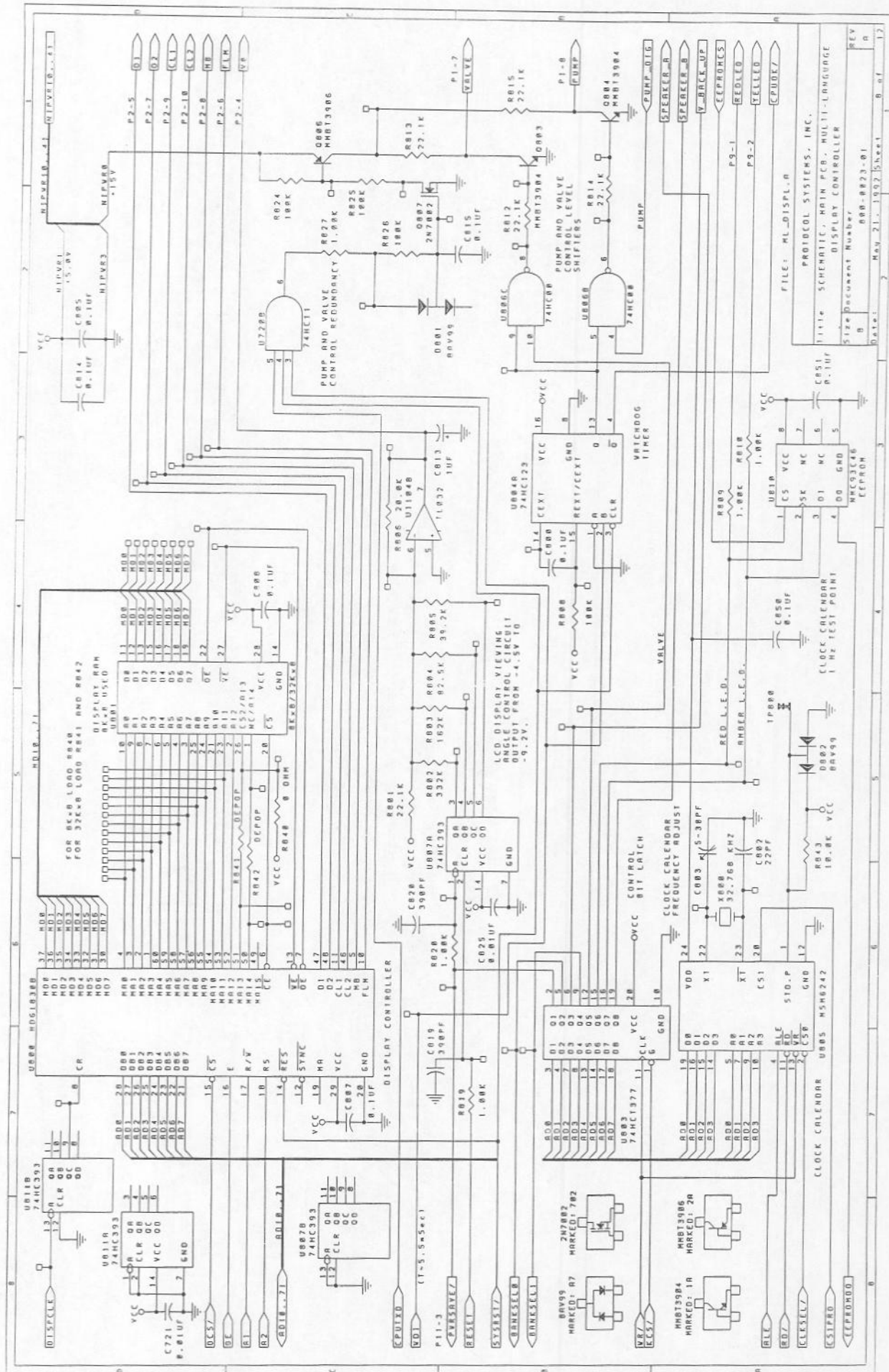
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 Size: 8 1/2 x 11
 Date: MAY 21, 1992
 Sheet: 7 of 17

FILE: ML_ECG.A
 Size: 100000
 Date: MAY 21, 1992
 Sheet: 7 of 17

FUNCTION	INPUT 1	INPUT 2	INPUT 3	INPUT 4	INPUT 5	INPUT 6	INPUT 7	INPUT 8	INPUT 9	INPUT 10	INPUT 11	INPUT 12	INPUT 13	INPUT 14	INPUT 15	INPUT 16	INPUT 17	INPUT 18	INPUT 19	INPUT 20	INPUT 21	INPUT 22	INPUT 23	INPUT 24	INPUT 25	INPUT 26	INPUT 27	INPUT 28	INPUT 29	INPUT 30	INPUT 31	INPUT 32	INPUT 33	INPUT 34	INPUT 35	INPUT 36	INPUT 37	INPUT 38	INPUT 39	INPUT 40	INPUT 41	INPUT 42	INPUT 43	INPUT 44	INPUT 45	INPUT 46	INPUT 47	INPUT 48	INPUT 49	INPUT 50	INPUT 51	INPUT 52	INPUT 53	INPUT 54	INPUT 55	INPUT 56	INPUT 57	INPUT 58	INPUT 59	INPUT 60	INPUT 61	INPUT 62	INPUT 63	INPUT 64	INPUT 65	INPUT 66	INPUT 67	INPUT 68	INPUT 69	INPUT 70	INPUT 71	INPUT 72	INPUT 73	INPUT 74	INPUT 75	INPUT 76	INPUT 77	INPUT 78	INPUT 79	INPUT 80	INPUT 81	INPUT 82	INPUT 83	INPUT 84	INPUT 85	INPUT 86	INPUT 87	INPUT 88	INPUT 89	INPUT 90	INPUT 91	INPUT 92	INPUT 93	INPUT 94	INPUT 95	INPUT 96	INPUT 97	INPUT 98	INPUT 99	INPUT 100	INPUT 101	INPUT 102	INPUT 103	INPUT 104	INPUT 105	INPUT 106	INPUT 107	INPUT 108	INPUT 109	INPUT 110	INPUT 111	INPUT 112	INPUT 113	INPUT 114	INPUT 115	INPUT 116	INPUT 117	INPUT 118	INPUT 119	INPUT 120	INPUT 121	INPUT 122	INPUT 123	INPUT 124	INPUT 125	INPUT 126	INPUT 127	INPUT 128	INPUT 129	INPUT 130	INPUT 131	INPUT 132	INPUT 133	INPUT 134	INPUT 135	INPUT 136	INPUT 137	INPUT 138	INPUT 139	INPUT 140	INPUT 141	INPUT 142	INPUT 143	INPUT 144	INPUT 145	INPUT 146	INPUT 147	INPUT 148	INPUT 149	INPUT 150	INPUT 151	INPUT 152	INPUT 153	INPUT 154	INPUT 155	INPUT 156	INPUT 157	INPUT 158	INPUT 159	INPUT 160	INPUT 161	INPUT 162	INPUT 163	INPUT 164	INPUT 165	INPUT 166	INPUT 167	INPUT 168	INPUT 169	INPUT 170	INPUT 171	INPUT 172	INPUT 173	INPUT 174	INPUT 175	INPUT 176	INPUT 177	INPUT 178	INPUT 179	INPUT 180	INPUT 181	INPUT 182	INPUT 183	INPUT 184	INPUT 185	INPUT 186	INPUT 187	INPUT 188	INPUT 189	INPUT 190	INPUT 191	INPUT 192	INPUT 193	INPUT 194	INPUT 195	INPUT 196	INPUT 197	INPUT 198	INPUT 199	INPUT 200	INPUT 201	INPUT 202	INPUT 203	INPUT 204	INPUT 205	INPUT 206	INPUT 207	INPUT 208	INPUT 209	INPUT 210	INPUT 211	INPUT 212	INPUT 213	INPUT 214	INPUT 215	INPUT 216	INPUT 217	INPUT 218	INPUT 219	INPUT 220	INPUT 221	INPUT 222	INPUT 223	INPUT 224	INPUT 225	INPUT 226	INPUT 227	INPUT 228	INPUT 229	INPUT 230	INPUT 231	INPUT 232	INPUT 233	INPUT 234	INPUT 235	INPUT 236	INPUT 237	INPUT 238	INPUT 239	INPUT 240	INPUT 241	INPUT 242	INPUT 243	INPUT 244	INPUT 245	INPUT 246	INPUT 247	INPUT 248	INPUT 249	INPUT 250	INPUT 251	INPUT 252	INPUT 253	INPUT 254	INPUT 255	INPUT 256	INPUT 257	INPUT 258	INPUT 259	INPUT 260	INPUT 261	INPUT 262	INPUT 263	INPUT 264	INPUT 265	INPUT 266	INPUT 267	INPUT 268	INPUT 269	INPUT 270	INPUT 271	INPUT 272	INPUT 273	INPUT 274	INPUT 275	INPUT 276	INPUT 277	INPUT 278	INPUT 279	INPUT 280	INPUT 281	INPUT 282	INPUT 283	INPUT 284	INPUT 285	INPUT 286	INPUT 287	INPUT 288	INPUT 289	INPUT 290	INPUT 291	INPUT 292	INPUT 293	INPUT 294	INPUT 295	INPUT 296	INPUT 297	INPUT 298	INPUT 299	INPUT 300	INPUT 301	INPUT 302	INPUT 303	INPUT 304	INPUT 305	INPUT 306	INPUT 307	INPUT 308	INPUT 309	INPUT 310	INPUT 311	INPUT 312	INPUT 313	INPUT 314	INPUT 315	INPUT 316	INPUT 317	INPUT 318	INPUT 319	INPUT 320	INPUT 321	INPUT 322	INPUT 323	INPUT 324	INPUT 325	INPUT 326	INPUT 327	INPUT 328	INPUT 329	INPUT 330	INPUT 331	INPUT 332	INPUT 333	INPUT 334	INPUT 335	INPUT 336	INPUT 337	INPUT 338	INPUT 339	INPUT 340	INPUT 341	INPUT 342	INPUT 343	INPUT 344	INPUT 345	INPUT 346	INPUT 347	INPUT 348	INPUT 349	INPUT 350	INPUT 351	INPUT 352	INPUT 353	INPUT 354	INPUT 355	INPUT 356	INPUT 357	INPUT 358	INPUT 359	INPUT 360	INPUT 361	INPUT 362	INPUT 363	INPUT 364	INPUT 365	INPUT 366	INPUT 367	INPUT 368	INPUT 369	INPUT 370	INPUT 371	INPUT 372	INPUT 373	INPUT 374	INPUT 375	INPUT 376	INPUT 377	INPUT 378	INPUT 379	INPUT 380	INPUT 381	INPUT 382	INPUT 383	INPUT 384	INPUT 385	INPUT 386	INPUT 387	INPUT 388	INPUT 389	INPUT 390	INPUT 391	INPUT 392	INPUT 393	INPUT 394	INPUT 395	INPUT 396	INPUT 397	INPUT 398	INPUT 399	INPUT 400	INPUT 401	INPUT 402	INPUT 403	INPUT 404	INPUT 405	INPUT 406	INPUT 407	INPUT 408	INPUT 409	INPUT 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610	INPUT 611	INPUT 612	INPUT 613	INPUT 614	INPUT 615	INPUT 616	INPUT 617	INPUT 618	INPUT 619	INPUT 620	INPUT 621	INPUT 622	INPUT 623	INPUT 624	INPUT 625	INPUT 626	INPUT 627	INPUT 628	INPUT 629	INPUT 630	INPUT 631	INPUT 632	INPUT 633	INPUT 634	INPUT 635	INPUT 636	INPUT 637	INPUT 638	INPUT 639	INPUT 640	INPUT 641	INPUT 642	INPUT 643	INPUT 644	INPUT 645	INPUT 646	INPUT 647	INPUT 648	INPUT 649	INPUT 650	INPUT 651	INPUT 652	INPUT 653	INPUT 654	INPUT 655	INPUT 656	INPUT 657	INPUT 658	INPUT 659	INPUT 660	INPUT 661	INPUT 662	INPUT 663	INPUT 664	INPUT 665	INPUT 666	INPUT 667	INPUT 668	INPUT 669	INPUT 670	INPUT 671	INPUT 672	INPUT 673	INPUT 674	INPUT 675	INPUT 676	INPUT 677	INPUT 678	INPUT 679	INPUT 680	INPUT 681	INPUT 682	INPUT 683	INPUT 684	INPUT 685	INPUT 686	INPUT 687	INPUT 688	INPUT 689	INPUT 690	INPUT 691	INPUT 692	INPUT 693	INPUT 694	INPUT 695	INPUT 696	INPUT 697	INPUT 698	INPUT 699	INPUT 700	INPUT 701	INPUT 702	INPUT 703	INPUT 704	INPUT 705	INPUT 706	INPUT 707	INPUT 708	INPUT 709	INPUT 710	INPUT 711	INPUT 712	INPUT 713	INPUT 714	INPUT 715	INPUT 716	INPUT 717	INPUT 718	INPUT 719	INPUT 720	INPUT 721	INPUT 722	INPUT 723	INPUT 724	INPUT 725	INPUT 726	INPUT 727	INPUT 728	INPUT 729	INPUT 730	INPUT 731	INPUT 732	INPUT 733	INPUT 734	INPUT 735	INPUT 736	INPUT 737	INPUT 738	INPUT 739	INPUT 740	INPUT 741	INPUT 742	INPUT 743	INPUT 744	INPUT 745	INPUT 746	INPUT 747	INPUT 748	INPUT 749	INPUT 750	INPUT 751	INPUT 752	INPUT 753	INPUT 754	INPUT 755	INPUT 756	INPUT 757	INPUT 758	INPUT 759	INPUT 760	INPUT 761	INPUT 762	INPUT 763	INPUT 764	INPUT 765	INPUT 766	INPUT 767	INPUT 768	INPUT 769	INPUT 770	INPUT 771	INPUT 772	INPUT 773	INPUT 774	INPUT 775	INPUT 776	INPUT 777	INPUT 778	INPUT 779	INPUT 780	INPUT 781	INPUT 782	INPUT 783	INPUT 784	INPUT 785	INPUT 786	INPUT 787	INPUT 788	INPUT 789	INPUT 790	INPUT 791	INPUT 792	INPUT 793	INPUT 794	INPUT 795	INPUT 796	INPUT 797	INPUT 798	INPUT 799	INPUT 800	INPUT 801	INPUT 802	INPUT 803	INPUT 804	INPUT 805	INPUT 806	INPUT 807	INPUT 808	INPUT 809	INPUT 810	INPUT 811	INPUT 812	INPUT 813	INPUT 814	INPUT 815	INPUT 816	INPUT 817	INPUT 818	INPUT 819	INPUT 820	INPUT 821	INPUT 822	INPUT 823	INPUT 824	INPUT 825	INPUT 826	INPUT 827	INPUT 828	INPUT 829	INPUT 830	INPUT 831	INPUT 832	INPUT 833	INPUT 834	INPUT 835	INPUT 836	INPUT 837	INPUT 838	INPUT 839	INPUT 840	INPUT 841	INPUT 842	INPUT 843	INPUT 844	INPUT 845	INPUT 846	INPUT 847	INPUT 848	INPUT 849	INPUT 850	INPUT 851	INPUT 852	INPUT 853	INPUT 854	INPUT 855	INPUT 856	INPUT 857	INPUT 858	INPUT 859	INPUT 860	INPUT 861	INPUT 862	INPUT 863	INPUT 864	INPUT 865	INPUT 866	INPUT 867	INPUT 868	INPUT 869	INPUT 870	INPUT 871	INPUT 872	INPUT 873	INPUT 874	INPUT 875	INPUT 876	INPUT 877	INPUT 878	INPUT 879	INPUT 880	INPUT 881	INPUT 882	INPUT 883	INPUT 884	INPUT 885	INPUT 886	INPUT 887	INPUT 888	INPUT 889	INPUT 890	INPUT 891	INPUT 892	INPUT 893	INPUT 894	INPUT 895	INPUT 896	INPUT 897	INPUT 898	INPUT 899	INPUT 900	INPUT 901	INPUT 902	INPUT 903	INPUT 904	INPUT 905	INPUT 906	INPUT 907	INPUT 908	INPUT 909	INPUT 910	INPUT 911	INPUT 912	INPUT 913	INPUT 914	INPUT 915	INPUT 916	INPUT 917	INPUT 918	INPUT 919	INPUT 920	INPUT 921	INPUT 922	INPUT 923	INPUT 924	INPUT 925	INPUT 926	INPUT 927	INPUT 928	INPUT 929	INPUT 930	INPUT 931	INPUT 932	INPUT 933	INPUT 934	INPUT 935	INPUT 936	INPUT 937	INPUT 938	INPUT 939	INPUT 940	INPUT 941	INPUT 942	INPUT 943	INPUT 944	INPUT 945	INPUT 946	INPUT 947	INPUT 948	INPUT 949	INPUT 950	INPUT 951	INPUT 952	INPUT 953	INPUT 954	INPUT 955	INPUT 956	INPUT 957	INPUT 958	INPUT 959	INPUT 960	INPUT 961	INPUT 962	INPUT 963	INPUT 964	INPUT 965	INPUT 966	INPUT 967	INPUT 968	INPUT 969	INPUT 970	INPUT 971	INPUT 972	INPUT 973	INPUT 974	INPUT 975	INPUT 976	INPUT 977	INPUT 978	INPUT 979	INPUT 980	INPUT 981	INPUT 982	INPUT 983	INPUT 984	INPUT 985	INPUT 986	INPUT 987	INPUT 988	INPUT 989	INPUT 990	INPUT 991	INPUT 992	INPUT 993	INPUT 994	INPUT 995	INPUT 996	INPUT 997	INPUT 998	INPUT 999	INPUT 1000
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U200/U201 LEAD SELECT TRUTH TABLE
 INPUT 1: PIN 1, FUNCTION 1, INPUT 1, DRIVEN
 INPUT 2: PIN 2, FUNCTION 2, INPUT 2, DRIVEN
 INPUT 3: PIN 3, FUNCTION 3, INPUT 3, DRIVEN
 INPUT 4: PIN 4, FUNCTION 4, INPUT 4, DRIVEN
 INPUT 5: PIN 5, FUNCTION 5, INPUT 5, DRIVEN
 INPUT 6: PIN 6, FUNCTION 6, INPUT 6, DRIVEN
 INPUT 7: PIN 7, FUNCTION 7, INPUT 7, DRIVEN
 INPUT 8: PIN 8, FUNCTION 8, INPUT 8, DRIVEN
 INPUT 9: PIN 9, FUNCTION 9, INPUT 9, DRIVEN
 INPUT 10: PIN 10, FUNCTION 10, INPUT 10, DRIVEN
 INPUT 11: PIN 11, FUNCTION 11, INPUT 11, DRIVEN
 INPUT 12: PIN 12, FUNCTION 12, INPUT 12, DRIVEN
 INPUT 13: PIN 13, FUNCTION 13, INPUT 13, DRIVEN
 INPUT 14: PIN 14, FUNCTION 14, INPUT 14, DRIVEN
 INPUT 15: PIN 15, FUNCTION 15, INPUT 15, DRIVEN
 INPUT 16: PIN 16, FUNCTION 16, INPUT 16, DRIVEN
 INPUT 17: PIN 17, FUNCTION 17, INPUT 17, DRIVEN
 INPUT 18: PIN 18, FUNCTION 18, INPUT 18, DRIVEN
 INPUT 19: PIN 19, FUNCTION 19, INPUT 19, DRIVEN
 INPUT 20: PIN 20, FUNCTION 20, INPUT 20, DRIVEN
 INPUT 21: PIN 21, FUNCTION 21, INPUT 21, DRIVEN
 INPUT 22: PIN 22, FUNCTION 22, INPUT 22, DRIVEN
 INPUT 23: PIN 23,

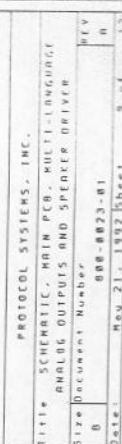




FILE: ML_DISPL.A

TITLE SCHEMATIC, MAIN PCB, MULTI-LANGUAGE
 DISPLAY CONTROLLER

Size Document Number
 8 888-8823-01
 Date: May 21, 1992 Sheet 1 of 12

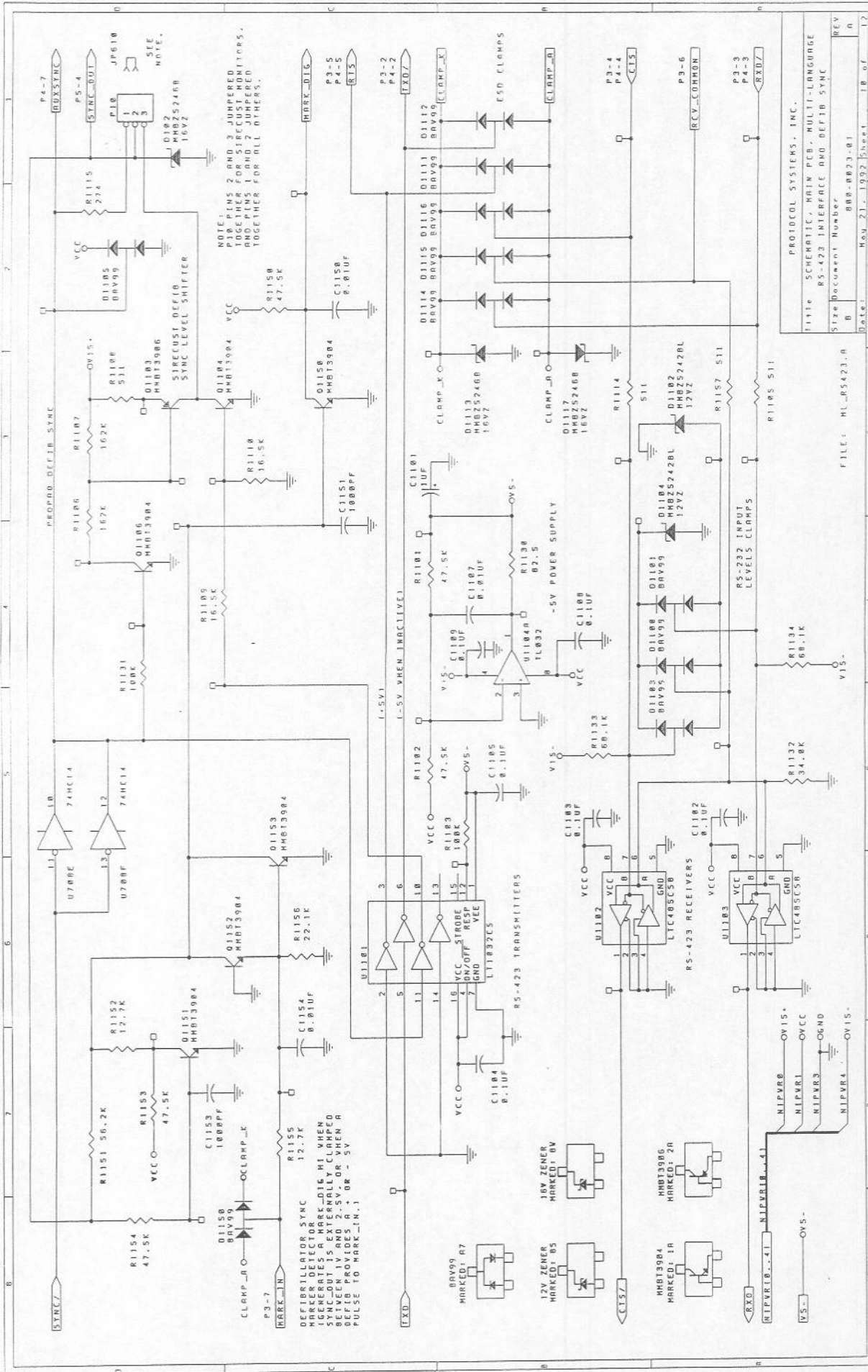
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S P E A K E R _ 5	
0	1
OFF	1
LO VOL	1
HI VOL	1

SPENCER_0	0
SPENCER_1	1
SPENCER_2	2

06050
74HC00

CSTRO IS GREATER THAN
4.75V 10 SECONDS AFTER
POWER UP. MEASURE
WITH 10M OHM OR GREATER
METER/OSCILLOSCOPE.



PROTOCOL SYSTEMS, INC.

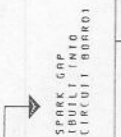
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Size: 800-0023-01

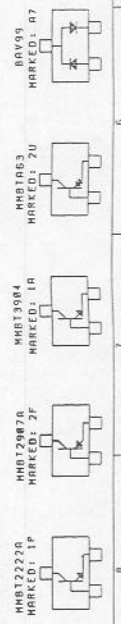
Date: May 21, 1992

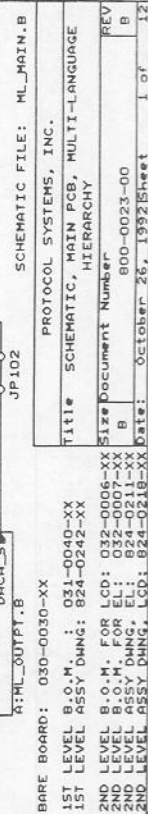
Sheet 1 of 12

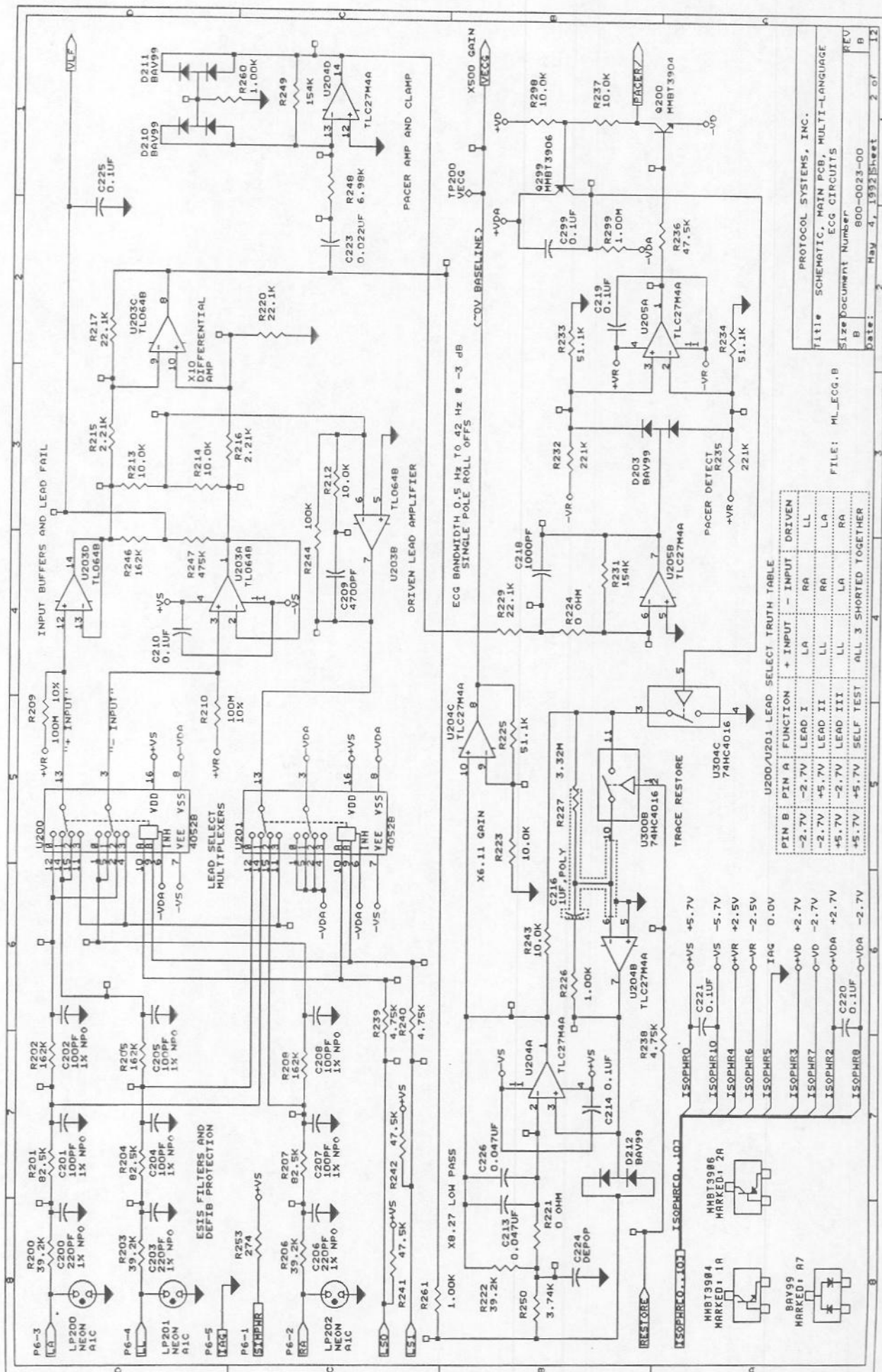
REV 0



NOTES: 1. 1681 LEADS 11 AND -EMF- ARE IN THE ORANGE SLEEVE. AND
2. 1681 LEAD 12 IS IN THE BLACK SLEEVE.
3. 1681 LEAD 15 IS A COUNTER EMF WINDING. IS A GREEN
WIRE. AND OPERATOR'S HOLES POINT UPWARD. THE CIRCUIT BOARD,
4. THE -P- OPERATOR IS BUILT INTO THE CIRCUIT BOARD.







PROTOCOL SYSTEMS, INC.

FILE: ML_ECG.B

Size Document Number 800-0023-00

Date: May 4, 1992 Sheet 2 of 12



2C—Recharger Board

Detailed Circuit Descriptions

Schematics 800-0033-00 and 800-0034-00, Section 2C

NOTE

Two different versions of the Recharger board schematics are shown in this manual. If your monitor has an LCD display, refer to schematic 800-0033-00. If your monitor has an EL display monitor, refer to schematic 800-0034-00. The following theory of operation descriptions apply to both versions, except where noted otherwise. See the table on page 2-4 for a summary of the different board types. Also see Table 6-1 in the Calibration/Maintenance manual.

The recharger board can be divided into three functional parts:

- NIBP “Plumbing” Circuit (*Schematic sheet 2*)
 - This part shows the cuff pump and primary valve with related control circuitry. An overpressure valve with its sensor and controls and “redundant” shutdown circuitry for the pump and primary valve are included.
- EL Supply/EL Backlight PS (*Schematic sheet 3*)
 - For the EL option, this part provides the dc voltages necessary to operate the EL display module.
 - For the LCD display option, this part is a power module, with control circuitry, which provides ac power to the EL backlight which illuminates the LCD display module.
- Recharger Power Circuit (*Schematic sheet 4*)
 - This part provides the voltage to charge the monitor battery. The circuit accepts a range of dc voltages (12 to 24 volts, nominal plus 10% tolerance) and converts it to the regulated voltage needed to charge the battery.

Recharger Power

Schematic 800-0033-00 or 800-0034-00, Sheet 4 of 4, Section 2C

Input Circuit

The recharger input circuitry (including ground) is isolated from the “non-isolated” circuitry of the Propaq monitor. The isolated circuitry is to the left of the dashed line is the isolated input portion. The Dc Input connector P3, shown within dashed lines on sheet 1 of 4, is also part of the isolated section. The isolation barrier provides protection from faults occurring in the DC power source applied to the charging circuit; it is not a patient isolation-level barrier. The barrier is impedance-limited by R52, R53, and C33 and voltage limited by LP1. This insures that voltages applied to a patient from electrosurgical equipment, defibrillators or other like sources will appear across the patient isolation barrier on the monitor PCB, not

across this barrier. The recharger isolation barrier is created by transformer (T2) and optocouplers (ISO1, ISO2, ISO3, and ISO4).

External DC power is applied to the recharger board through P3, the DC Input connector on the monitor right side panel. The input pin of P3 is connected to F1. The input line is filtered by C25, C40, and an inductor which is part of the T2 assembly (pins 4 and 5). This filter prevents noise (EMI) from being transmitted back out of the system. Additional filtering is done in the right side panel assembly.

Recharger/Regulator Circuit

The recharger circuit is based on a current-mode PWM controller, U2. U2 has push-pull outputs which directly drive power MOSFETs Q10 and Q11. The FETs drive the balanced transformer portion of T2 (pins 1 and 3). Power is connected to the transformer through pin 2. T2 is a transformer/-inductor that is made up of three independent parts, the input inductor and transformer previously mentioned, and an output inductor (pins 9 and 10).

The output of the transformer (pins 6 and 8 with respect to grounded pin 7) is fullwave rectified by D18 (dual diode) and connected to the output inductor (pins 9 and 10 of T2). R79, R78, and C41 form a "snubber" to limit transient voltage peaks on D18, and reduce EMI. Energy is stored in the output inductor during the on time of each half cycle of the drive applied to the transformer. The PWM controller runs at a nominal frequency of 100 kHz. Each output can be on for a maximum time that is slightly less than one half the period of the 100 kHz. A slight dead time insures that the two outputs cannot be on simultaneously. The maximum on time allowed by U2 is therefore something less than 5 μ s, with a period of 10 μ s before the same output turns on again. The actual on time will be less and is what regulates the output of the charger. It is affected by load requirements and input voltage.

The output inductor is connected to C24 which supplies output voltage filtering. Energy stored in the inductor during the on time discharges into C24 and the load during the off time. The output connects to the battery (+BAT) through P4 (sheet 1). When the monitor is on, +BAT is the monitor power source (connected to +VSW by the switch).

The regulator is cycle-by-cycle current-limited. The common sources of Q10 and Q11 are connected to common (GND) through a current sampling resistor made up of the parallel combination of R22, R23, R24, and R25. The voltage developed across the current sampling resistor is filtered by R26 and C17 to remove high frequency noise and applied to the +ISEN input of U2. For this application, the -ISEN input is grounded, with care being taken to ground it at the same point on the PCB as the current sampling resistor combination, and the filter, to eliminate errors caused by different potentials at different grounding points. When the voltage at +ISEN reaches a level which is programmed by the voltage at the ILIM pin the on time of the cycle is terminated.

The voltage on ILIM is derived from VREF (a reference voltage generated by U2) and determined by a voltage divider which includes RP4. The current limit is set by adjusting RP4. Note also that the voltage on ILIM involves R30. When R30 is connected to the input common, or ground, the current limit is reduced. This limits the maximum power input to the

recharger to a level compatible to the 10.5 watt power adapter currently supplied for use with the monitor. When R30 is left open, the recharger can run at a much higher power limit. The condition of R30 is determined by a jumper on the connector plugged into P3.

The output, which is on the monitor common side of the barrier, has three associated circuits. They are a voltage feedback circuit, an over-voltage protection circuit, and an indicator LED showing that the recharger is running. The first two have to feed back to the input side of the barrier via opto-coupled devices. These circuits must be connected to the output when the recharger is on (i.e., a sufficient voltage must be applied to the side panel DC Input connector to run U2), but must be disconnected when the recharger is off to prevent discharge of the battery (also connected to the output). Q13, Q19, and Q25 serve the function of connection and disconnection of these circuits.

When the recharger is powered, current flows through the series combination of the input or LED portions of ISO1 and ISO4. ISO4 turns on pulling the gate of Q19 to ground, which turns on Q19 connecting the voltage feedback circuit to the output. Note that R32 and the base/emitter junction of Q12 are in parallel with the input of ISO1. Initially this limits the voltage across the input of ISO1 to a level less than that required for turn on (i.e., the current that turns on ISO4 flows through R32 and the junction). The collector of Q12 provides the power for the output stage of U2. When the input voltage is such that U12 starts to run, its output stage draws collector current from Q12 (and then emitter current flows), which increases the voltage drop across R32 allowing ISO1 to turn on. This in turn turns on Q25 and Q13 which power the right side panel LED and connect the over current protection circuit respectively. Since U2 has a low voltage shutdown circuit, the above scenario prevents the LED from turning on when there is some input voltage but not enough to actually allow U2 to run, keeping in mind that the output line is still powered by the battery even when U2 is off. The delay in connecting the over voltage protection circuit helps prevent turn on spikes, particularly if the circuit is turned on with no load or battery attached, from activating the over voltage circuit. Zener diode, D17 limits the maximum voltage to VC of U2 to a safe value when the input voltage is at the high end of its range. In this connection the forward voltage drop of ISO1's LED together with R32 and Q12 form a current limited supply. D25 and D26 provide ESD protection for the disconnect FET's.

U2 has a built in voltage sense amplifier. Normal operation would be to feed back a sample of the output to -EAMP and EREF (or a fraction thereof) to +EAMP. In this case, since the voltage is sampled on the other side of the barrier, this amplifier isn't used. It is connected so that it sees no output, which by itself would turn the amplifier, and hence the supply, hard on. Pulling down on the COMP input has the same effect inside U2 as the internal amplifier would have. The output of ISO3 serves this purpose. U3 is a combination reference and amplifier. When the voltage on pin 8 reaches the reference voltage, pin 1 conducts. The output of the supply is connected through a voltage divider to pin 8. The top of the divider is R37. The bottom of the divider is formed by R47, RP2 and THERM1. THERM1 is a thermistor located in the battery compartment and connected through P1. The lower end of THERM1 is connected to ground, completing the divider. R45 and R44 provide a threshold and current limit for ISO1/U3. RP2

provides a setpoint adjustment, and THERM1 provides temperature tracking. When the output reaches its set point, U3 conducts, ISO3 turns on and its open collector output pulls down on the COMP input of U2 which completes the voltage regulating loop.

The overprotection circuit is virtually identical to the voltage regulating circuit on the output side of the barrier. Looking at the schematic will reveal details for all the components mentioned in the regulator circuit. It is set, using RP3 to a level somewhat higher than the regulator circuit. If the output reaches this level, U4 conducts turning on ISO2. Note that this should never happen during normal operation; it is a protection should a failure allow the output to "run away". The output of ISO2 is a pilot SCR rather than a transistor. When ISO2 turns on, it in turn fires Q15, a higher current SCR. Turning on Q15 blows fuse F1 removing power from the unit. L3 provides a di/dt limit for Q15. TRAN1 is a transorb. It behaves like a high current diode in the forward direction and a high power zener in the reverse direction. If the unit is supplied voltage of the wrong polarity or above its maximum input rating, TRAN1 will turn on and blow fuse F1.

Power Distribution

Also shown on this sheet, in conjunction with sheet 1, is the power distribution in the monitor. The battery, which is connected to the recharger output, is connected to the "normally open" terminal of the right side panel power switch through fuse F2 and pin 2 of P2. Turning on the monitor connects the normally open terminal to the common terminal. The common terminal, which is therefore connected to the battery and recharger in the on position, is labeled +VSW and returns to the recharger board through pin 1 of P2. This +VSW bus is used elsewhere on this board and loops back off the board through pins 1 and 2 of P5 for use on other boards in the monitor. In the off position +VSW is connected to the "normally closed" switch contact which returns to the board through pin 3 of P2 and is connected to ground through R49. This facilitates the discharge of input filter capacitors on other boards. See the operational description of the restart cycle of the main board power supply.

Plumbing

Schematic 800-0033-00 or 800-0034-00, Sheet 2 of 4, Section 2C

This schematic shows the pump (M1) and the main valve (VLV1). These are the two active items needed for inflating and deflating the cuff when taking an NIBP measurement. The remainder of the schematic shows control and protection functions.

Several signals come directly or indirectly from the monitor main board through P5 or P6. VCC and SHUTDOWN/ come through P6 and in the EL monitor loop through the interface board. In the LCD monitor they come directly from the main board. The signals labeled VALVE and PUMP are approximately 15 volt levels coming from the main board. They are taken off the collector of a grounded emitter transistor having a 100 k Ω pull up resistor.

When "VALVE" is high, Q4 and Q1 turn on. This pulls one terminal of VLV1 to ground along with one terminal of C1. This allows base current to flow from Q2, turning on Q2 and pulling the other terminal of VLV1 up to

+VSW. This energizes the valve causing it to close. C1 will charge through R4 and R3 up to +VSW and Q2 will turn off leaving the valve connected to V4.0 and ground, which is sufficient to keep it energized, but not enough for proper initial turn on.

When PUMP is high Q3 turns on. If Q1 is on at the same time, the negative terminal of the pump is pulled to ground turning on the pump. Notice that due to the sharing of Q1 in the pull down path, the pump can be on only when the valve is energized. Q1 provides redundancy for safety purposes. Note also that any time Q18 is turned on both the pump and the valve are disabled. Q18 is turned on when U5C pin 8 is high. U5C together with U5D form an R/S flip-flop (f/f) which is part of the over pressure protection system.

During turn on, U5D pin 12 is held low by C62 until C62 charges through R62. U5C pin 10 follows VCC during turn on via R90 and to some degree C39. This insures that the f/f initializes with U5D pin 11 high and U5C pin 8 low. Once pin 12 has charged high, any low signal applied to pin 12 will reverse the state of the outputs. If this should occur, the only way to reset the state of the outputs is to shut the monitor off and repeat the power up sequence. When the state of the f/f switches, Q18 is turned on. Also a backup bleed valve is temporarily energized as will be shown in the following description..

Note that when VCC is present (i.e., unit turned on and running) Q31 is on which turns on Q30. The drain of Q30 provides a connection to +VSW when the unit is operating, which powers some of the circuitry that follows. The purpose of the Q31/Q30 circuit is to disconnect if a low voltage shutdown occurs. In this case, the power switch is still on (+VSW connected to the battery) and all loads that would cause further discharge should be removed from the battery.

The backup valve, VLV2, is normally closed and is energized (opened) by turning on Q28. The gate of Q28 will be pulled high through R82 and Q30 as long as neither Q27 nor Q32 are on, Q27 is normally on since it is connected to pin 11 of the f/f through R91. C63 assures that Q27 is on during start up preventing the valve from "chattering". U7 is a combination oscillator and counter chip which is held in reset as long as pin 11 of the f/f is high. In this case U7 pin 3 is low and Q32 is off. When the f/f changes from its turn on state, Q27 turns off opening VLV2, and Q18 turns on disabling the primary valve and the pump. In addition U7 is taken out of reset. U7's oscillator runs at approximately 60 Hz and approximately 2 minutes after the f/f has been reset Q14 (pin 7) goes high. This disables the oscillator via D29, latching the output of U7, and turning on Q32. Turning on Q32 turns VLV2 back off. To summarize, resetting the f/f disables the pump and main valve until the power switch is cycled, and opens the emergency bleed valve for approximately 2 minutes.

PT1 is a pressure sensor mounted on the recharger board, but providing backup check on the pressure in the NIBP air line. U6A and U6B are high impedance voltage followers to buffer the outputs of PT1. The buffered outputs are amplified by a differential amplifier made up of U6D and associated resistors. U6C serves as a comparator with some hysteresis provided by the positive feedback network. When the output of U6D exceeds the set point determined by RP5, U6C goes high. High in this case

being somewhat less than the plus rail of U6 which is the near the battery voltage, not a standard logic high. U6C is coupled to Q29 with a time constant determined by R97 and the parallel combination C69 and C70. The time constant rejects short pressure transients caused by patient motion and not representing a true over pressure situation. If U6C is high for more than a few seconds, Q29 turns on, pulling R90 and D21 down to ground and C39 charges to ground through R63 bringing pin 10 of the f/f with it. This resets the f/f putting into action the protection scenario previously described.

A signal called SHUTDOWN/ is coupled to pin 10 of the f/f through R98 and C71. SHUTDOWN/ is generated by the DCP processor on the main board. Its normal function is to cause the shutdown of circuits throughout the monitor (see EL power supply on this board for an example). However it can be asserted for a short time without causing these circuits to respond due to their time constraints. Therefore it can be used as a control in addition to its normal function. When the DCP "decides" there is some other (than over pressure) problem it asserts SHUTDOWN/ low for approximately 40 ms. This resets the f/f and again the protection scenario proceeds. The coupling time constants were chosen to carry out the above described functions as well as providing ESD immunity.

EL Power

Schematic 800-0033-00 or 800-0034-00, Sheet 3 of 4, Section 2C

For the LCD monitor, schematic 800-0033-00, this section is nothing more than a module, PS1, that supplies AC power to an EL backlight behind the LCD display. It is turned on by Q6 which in turn is controlled by the signal VBACKLITE, a 15 volt control signal from the main board. The associated diodes and capacitor provide transient and ESD protection. Also shown on the sheet are some portions of U5 not used in the LCD monitor but shown since a portion of U5 is used in the plumbing section and hence the chip must be loaded.

For the EL monitor, schematic 800-0034-00, this section is a power supply that provides the several DC voltages needed by the EL display. U1 is a PWM switching regulator very similar to the ones used and described elsewhere in the manual. The main board supply and the "system" supply on the printer board are examples. In this case the chip runs at a nominal 100 kHz. Power, +VSW, is supplied through an input filter, L1 and C11, to the primary of T1 (pin 3). The other side of the primary (pin 4) is switched to ground through the switch contained in U1, forming a basic flyback topology switching regulator. The multiple secondaries form multiple outputs through their various diodes and output filter capacitors. One of the differences between this and the other flyback switching power supplies is the very high ratios between some of the output voltages and the input voltage. The outputs range from nominal plus 215 volts to minus 175 volts with several values in between.

The implementation of this supply required a very carefully designed transformer. With the high ratios involved items such as capacitance reflected from the secondaries into the primary became very critical. The Shotky snubber, D19, is necessary to prevent the primary from "ringing" negative at the end of the on time of the switch (this being a discontinuous mode converter). This is not normally a problem in converters with much

lower input to output ratios. The +215 volt supply is the one fed back for voltage regulation. The other supplies are also critical, the -175 volt supply is specified to $\pm 1\%$ and most of the other to $\pm 5\%$. This supply to supply tracking is again accomplished through a very careful transformer design.

RP1 provides an adjustment range for the +215 volt supply of approximately $\pm 10\%$. The other outputs track in direct proportion maintaining their tolerance. For example, if the "+215" volt supply is set to +225 volts, the "-175" supply is required to be -181.1 volts $\pm 1\%$.

The EL driver circuitry requires VCC and V+12 to precede the higher voltages at turn on. VCC is supplied to both the EL driver and this EL power supply by the monitor main board. At turn on VCC is supplied to U1 through a filter, R8 and C13. At the same time, VCC turns on Q8 and hence Q7 which pulls the collector of Q7 to +VSW. +VSW is coupled to the V+12 line through D14, which pulls the V+12 line up to +VSW less a diode drop. Although this is not as high as it finally gets, it is adequate for startup. When V+12 reaches its normal level, D14 turns off.

The monitor main board asserts the signal SHUTDOWN/ low to indicate that the shutdown process has been initiated. It is applied to U5A pin 1. The EL driver board supplies a signal /PSENBL which is low when the driver is working normally, but is asserted high if certain faults are detected indicating that the high voltage supplies should be removed. /PSENBL is inverted by Q26 and applied to U5A pin 2. If either signal indicates a shutdown condition, U5A pin 3 is driven high.

A high on U5A pin 3 turns on Q20 which pulls down on pin 1 of U1, shutting down the supply. It also, through inverter U5B, turns off Q21 (normally on). This turns on Q24 which supplies base current to Q22, connecting a load (R73, R74, R75, R76, R77) to the +215 (also called Vfb). This load current is returned to V-175 through Q23. As those supplies collapse, they are connected to +107 and -87 by D22 and D23 to discharge those two supplies. Since +215 is actually a lower voltage DC supply stacked on +40 the +40 will also be picked up and discharged. The +20 volt supply supplies the base drive for Q22. Therefore the high voltage supplies are discharged in a few seconds at turn off to protect the EL module and to provide safety for service personnel without having power consuming bleeder resistors constantly connected.

Bill of Materials—Recharger Board

Reference Designator	Part Number	Description
DZ Dwg Designator (Dwg. #824-0243-00), Recharger Brd 2nd Lvl Assy. 032-0008-00 (LCD)		
1	650-0007-00	TAPE,BLACK,.750" WIDE
2	620-0183-00	CRADLE,PUMP,MODIFIED
3	620-0156-00	SCREW,8-32 X 0.25,PH,PH,SS,NYLOC
4	620-0155-00	NUT,HEX,8-32,ESP,SS
5	010-0061-00	CABLE SUBASSY,VANE PUMP
6	620-0022-00	CABLE TIE, NYLON, 7 INCH MIN LENGTH X .19 X .053
7	680-0009-00	PUMP,BP,VANE
8	503-0008-00	FUSE, PICO, 3A, 125V
9	650-0027-00	TAPE,ACRYLIC FOAM,DOUBLE COATED,.090"
	031-0043-00	ASSY,M/L RECHARGER,PCB,LCD
	824-0243-00	ASSY DWG,M/L RECHARGER PCB,2ND LEVEL
	824-0247-00	ASSY DWG,M/L RECHARGER,PCB LCD
DZ Dwg Designator (Dwg. #824-0243-00), Recharger Brd 2nd Lvl Assy. 032-0009-00 (EL)		
1	650-0007-00	TAPE,BLACK,.750" WIDE
2	620-0154-00	CRADLE, PUMP
3	620-0156-00	SCREW,8-32 X 0.25,PH,PH,SS,NYLOC
4	620-0155-00	NUT,HEX,8-32,ESP,SS
6	620-0022-00	CABLE TIE, NYLON, 7 INCH MIN LENGTH X .19 X .053
7	680-0009-00	PUMP,BP,VANE
8	503-0008-00	FUSE, PICO, 3A, 125V
9	650-0027-00	TAPE,ACRYLIC FOAM,DOUBLE COATED,.090"
	010-0061-00	CABLE SUBASSY,VANE PUMP
	031-0042-00	ASSY,M/L RECHARGER,PCB,EL
	824-0246-00	ASSY DWG,M/L RECHARGER,PCB,EL
	824-0243-00	ASSY DWG,M/L RECHARGER PCB,2ND LEVEL

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0032-00	PCB, BARE, M/L RECHARGER
	800-0034-00	SCHEMATIC, RECHARGER, M/L, EL
	824-0246-00	ASSY DWG, M/L RECHARGER, PCB, EL
C1	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C4	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C5	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C6	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C7	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C8	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C9	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C10	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C11	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C12	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C13	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C15	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C16	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C31	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C36	260-0008-00	CAP, FILM, 0.1UFD, 250V, 10%, RADIAL LEAD

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C39	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C40	250-0021-00	CAP,330MFD,10X20,35V,+/-20%
C41	261-0029-00	CAP,SMD,CER,47PF,200V,5%,NPI,1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D6	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D7	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D8	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D9	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D10	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D11	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D12	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D13	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D14	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,200V
D19	307-0016-07	DIODE,SCHOTTKY,1AMP,60V
D20	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D22	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D23	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V
F2	503-0008-00	FUSE, PICO, 3A, 125V

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
ISO1	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
L1	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L3	350-0010-00	INDUCTOR, AIR CORE, 150NH
LP1	500-0001-00	LAMP, NEON, A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN, .100
P3	610-0109-00	HEADER, 3 PIN, LOCKING, .156 CENTERS, SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN, .100
P6	610-0117-00	HEADER, 14PIN, 2X7, .1X.1", LOW PROFILE, LOCK PIN
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q2	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q3	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q4	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q7	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q8	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q10	302-0007-00	XSTR, POWER FIELD EFFECT, MTP25N10E, TO-220
Q11	302-0007-00	XSTR, POWER FIELD EFFECT, MTP25N10E, TO-220
Q12	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q13	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q19	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q20	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q21	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q22	301-0012-10	XSTR, MMBTA42L, NPN, HIGH VOLTAGE
Q23	301-0011-10	XSTR, MMBTA92L, PNP, HIGH VOLTAGE
Q24	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q25	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q26	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q27	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q28	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q29	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q30	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q31	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q32	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R8	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R9	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R10	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R11	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R12	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R16	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R17	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R18	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R19	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R20	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R59	201-1272-00	RES,SMD,12.7K,1.0%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R69	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R70	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R71	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R72	201-1213-00	RES,SMD,121K,1%,0.125W,1206
R73	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R74	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R75	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R76	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R77	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R81	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%

EC Drawing Designator (Dwg. #824-0246-00), EL Recharger Board 031-0042-00		
Reference Designator	Part Number	Description
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP1	225-0003-00	RES,POTENTIOMETER,10K,.5W,20%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP4	225-0005-00	RES,VARIABLE,500 OHM,0.5W,10%,AXIAL
RP5	228-0003-00	TRIM POT,10 TURNS,100K OHM
T1	360-0005-00	TRANSFORMER,EL DRIVER
T2	360-0006-00	TRANSFORMER,RECHARGER,W IN/OUT INDUCTORS
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR,SMD,33V,1500W
U1	474-0007-04	IC,LT1170CT,SWITCHING REGULATOR,100KHZ
U2	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U3	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U7	400-4060-03	IC,14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE,CLIPPARD
VLV2	680-0036-00	VALVE,AIR SOLENOID

ED Drawing Designator (Dwg. #824-0247-00), LCD Recharger Board 031-0043-00		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0032-00	PCB, BARE, M/L RECHARGER
	800-0033-00	SCHEMATIC, RECHARGER, M/L, LCD
	824-0247-00	ASSY DWG, M/L RECHARGER, PCB LCD
C1	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C3	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, 0.1UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C31	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C39	261-0012-00	CAP, SMD, CERAMIC, 0.1UF, +/-5
C40	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C41	261-0029-00	CAP, SMD, CER, 47PF, 200V, 5%, NPI, 1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

ED Drawing Designator (Dwg. #824-0247-00), LCD Recharger Board 031-0043-00		
Reference Designator	Part Number	Description
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D4	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,20OV
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D24	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V
F2	503-0008-00	FUSE, PICO, 3A, 125V
ISO1	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
L3	350-0010-00	INDUCTOR,AIR CORE,150NH
LP1	500-0001-00	LAMP,NEON,A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN,.100
P3	610-0109-00	HEADER,3 PIN,LOCKING,.156 CENTERS,SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN,.100
P6	610-0049-00	HEADER,2PIN,.100 CTR
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
P8	610-0020-00	HEADER, 2 PIN .100 CENTER, 1100-8-102-01
PS1	503-0042-00	INVERTER,MULTI LANGUAGE LCD
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q2	301-0003-10	TRANSISTOR,PNP DARLINGTON,MMBTA63,SOT23 PK
Q3	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q4	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q6	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q10	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q11	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220

ED Drawing Designator (Dwg. #824-0247-00), LCD Recharger Board 031-0043-00		
Reference Designator	Part Number	Description
Q12	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
Q13	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q19	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q25	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q27	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q28	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q29	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q30	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q31	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q32	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R7	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%

ED Drawing Designator (Dwg. #824-0247-00), LCD Recharger Board 031-0043-00		
Reference Designator	Part Number	Description
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R67	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT

ED Drawing Designator (Dwg. #824-0247-00), LCD Recharger Board 031-0043-00		
Reference Designator	Part Number	Description
RP4	225-0005-00	RES,VARIABLE,500 OHM,0.5W,10%,AXIAL
RP5	228-0003-00	TRIM POT,10 TURNS,100K OHM
T2	360-0006-00	TRANSFORMER,RECHARGER,W IN/OUT INDUCTORS
TP1	503-0022-00	TEST TERMINAL
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR,SMD,33V,1500W
U2	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U3	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U7	400-4060-03	IC,14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE,CLIPPARD
VLV2	680-0036-00	VALVE,AIR SOLENOID

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0032-00	PCB, BARE, M/L RECHARGER
	640-0265-00	LABEL, BAR CODE PCB
	800-0034-00	SCHEMATIC, RECHARGER, M/L, EL
	824-0246-01	ASSY DWG, M/L RECHARGER PCB, EL
C1	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C4	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C5	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C6	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C7	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C8	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C9	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C10	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C11	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C12	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C13	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C15	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C16	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C31	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
C36	260-0008-00	CAP,FILM,0.1UF,250V,10%,RADIAL LEAD
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C39	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C40	250-0021-00	CAP,330MFD,10X20,35V,+/-20%
C41	261-0029-00	CAP,SMD,CER,47PF,200V,5%,NPI,1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D6	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D7	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D8	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D9	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D10	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D11	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D12	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D13	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D14	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,200V
D19	307-0016-07	DIODE,SCHOTTKY,1AMP,60V
D20	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D22	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D23	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
F2	503-0008-00	FUSE, PICO, 3A, 125V
ISO1	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER, NEC PS2501-1
L1	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L3	350-0010-00	INDUCTOR, AIR CORE, 150NH
LP1	500-0001-00	LAMP, NEON, A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN, .100
P3	610-0109-00	HEADER, 3 PIN, LOCKING, .156 CENTERS, SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN, .100
P6	610-0117-00	HEADER, 14PIN, 2X7, .1X.1", LOW PROFILE, LOCK PIN
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q2	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q3	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q4	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q7	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q8	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q10	302-0007-00	XSTR, POWER FIELD EFFECT, MTP25N10E, TO-220
Q11	302-0007-00	XSTR, POWER FIELD EFFECT, MTP25N10E, TO-220
Q12	301-0005-10	TRANSISTOR, SMT, MMBT2907A, SOT-23 PKG
Q13	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q19	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q20	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q21	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q22	301-0012-10	XSTR, MMBTA42L, NPN, HIGH VOLTAGE
Q23	301-0011-10	XSTR, MMBTA92L, PNP, HIGH VOLTAGE
Q24	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q25	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q26	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q27	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q28	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q29	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL
Q30	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q31	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q32	301-0007-10	XSTR, 2N7002, TMOSFET, N-CHANNEL

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R8	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R9	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R10	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R11	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R12	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R16	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R17	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R18	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R19	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R20	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R59	201-1272-00	RES,SMD,12.7K,1.0%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R69	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R70	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R71	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R72	201-1213-00	RES,SMD,121K,1%,0.125W,1206
R73	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R74	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R75	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R76	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R77	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R81	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%

EQ Drawing Designator (Dwg. #824-0246-01), EL Recharger Board 031-0042-01		
Reference Designator	Part Number	Description
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP1	225-0003-00	RES,POTENTIOMETER,10K,.5W,20%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP4	225-0005-00	RES,VARIABLE,500 OHM,0.5W,10%,AXIAL
RP5	228-0003-00	TRIM POT,10 TURNS,100K OHM
T1	360-0005-00	TRANSFORMER,EL DRIVER
T2	360-0006-00	TRANSFORMER,RECHARGER,W IN/OUT INDUCTORS
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR,SMD,33V,1500W
U1	474-0007-04	IC,LT1170CT,SWITCHING REGULATOR,100KHZ
U2	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U3	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U7	400-4060-03	IC,14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE,CLIPPARD
VLV2	680-0036-00	VALVE,AIR SOLENOID

EP Drawing Designator (Dwg. #824-0247-01), LCD Recharger Board 031-0043-01		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0032-00	PCB, BARE, M/L RECHARGER
	640-0265-00	LABEL, BAR CODE PCB
	800-0033-00	SCHEMATIC, RECHARGER, M/L, LCD
	824-0247-01	ASSY DWG, M/L RECHARGER PCB, LCD
C1	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C3	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C31	260-0013-00	CAP, CER, 1.0UF, 10%, 50V
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C39	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C40	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C41	261-0029-00	CAP, SMD, CER, 47PF, 200V, 5%, NPI, 1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO

EP Drawing Designator (Dwg. #824-0247-01), LCD Recharger Board 031-0043-01		
Reference Designator	Part Number	Description
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D4	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,200V
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D24	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V
F2	503-0008-00	FUSE, PICO, 3A, 125V
ISO1	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
L3	350-0010-00	INDUCTOR,AIR CORE,150NH
LP1	500-0001-00	LAMP,NEON,A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN,.100
P3	610-0109-00	HEADER,3 PIN,LOCKING,.156 CENTERS,SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN,.100
P6	610-0049-00	HEADER,2PIN,.100 CTR
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
P8	610-0020-00	HEADER, 2 PIN .100 CENTER, 1100-8-102-01
PS1	503-0042-00	INVERTER,MULTI LANGUAGE LCD
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q2	301-0003-10	TRANSISTOR,PNP DARLINGTON,MMBTA63,SOT23 PK
Q3	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q4	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q6	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q10	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220

EP Drawing Designator (Dwg. #824-0247-01), LCD Recharger Board 031-0043-01		
Reference Designator	Part Number	Description
Q11	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q12	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
Q13	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q19	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q25	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q27	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q28	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q29	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q30	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q31	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q32	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R7	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%

EP Drawing Designator (Dwg. #824-0247-01), LCD Recharger Board 031-0043-01		
Reference Designator	Part Number	Description
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R67	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT

EP Drawing Designator (Dwg. #824-0247-01), LCD Recharger Board 031-0043-01		
Reference Designator	Part Number	Description
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP4	225-0005-00	RES, VARIABLE, 500 OHM, 0.5W, 10%, AXIAL
RP5	228-0003-00	TRIM POT, 10 TURNS, 100K OHM
T2	360-0006-00	TRANSFORMER, RECHARGER, W IN/OUT INDUCTORS
TP1	503-0022-00	TEST TERMINAL
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR, SMD, 33V, 1500W
U2	475-0003-00	CURRENT MODE PWM CONTROLLER, SMD
U3	473-0003-03	IC, TL431AD, PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC, TL431AD, PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC, SMD, 74HC132, QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC, SMD, TLC27L9CD, OP AMP, LOW OFFSET, LOW POWER
U7	400-4060-03	IC, 14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE, CLIPPARD
VLV2	680-0036-00	VALVE, AIR SOLENOID

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0036-00	BARE PCB, M/L RECHARGER
	640-0265-00	LABEL, BAR CODE PCB
	800-0038-00	SCHEMATIC, M/L RECHGER, EL
	825-0030-00	REF. DWG, M/L, EL/LCD, HW AND SW COMPP. MATRIX
	824-0261-00	ASSY DWG, M/L RECHARGER PCB, EL
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C4	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C5	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C6	250-0032-00	CAP, ELECTROLYTIC, 10UF, 250V, +/-20%"
C7	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C8	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C9	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C10	250-0015-00	CAP, ELECTROLYTIC, 33UF, 250V, 105DEG C, +/-20%
C11	250-0017-00	CAP, ELECTROLYTIC, 82UF, 25V, 105DEG C, +/-20%
C12	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C13	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C15	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C31	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C36	260-0008-00	CAP, FILM, 0.1UF, 250V, 10%, RADIAL LEAD
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
C39	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C40	250-0021-00	CAP,330MFD,10X20,35V,+/-20%
C41	261-0029-00	CAP,SMD,CER,47PF,200V,5%,NPI,1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C74	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C75	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C76	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C77	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C78	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C79	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C80	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C81	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C82	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C83	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C84	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D6	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D7	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D8	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D9	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D10	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D11	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D12	307-0013-07	DIODE,ULTRA FAST,1AMP,600V,MUR160
D13	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D14	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,200V
D19	307-0016-07	DIODE,SCHOTTKY,1AMP,60V
D20	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D22	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D23	306-0004-08	DIODE,SWITCHING,HIGH VOLTAGE
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V
F2	503-0008-00	FUSE, PICO, 3A, 125V
ISO1	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
L1	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L3	350-0010-00	INDUCTOR,AIR CORE,150NH
LP1	500-0001-00	LAMP,NEON,A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN,.100
P3	610-0109-00	HEADER,3 PIN,LOCKING,.156 CENTERS,SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN,.100
P6	610-0117-00	HEADER,14PIN,2X7,.1X.1",LOW PROFILE,LOCK PIN
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q2	301-0003-10	TRANSISTOR,PNP DARLINGTON,MMBTA63,SOT23 PK
Q3	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q4	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q7	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE
Q8	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q10	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q11	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q12	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
Q13	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q19	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q20	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q21	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q22	301-0012-10	XSTR,MMBTA42L,NPN,HIGH VOLTAGE
Q23	301-0011-10	XSTR,MMBTA92L,PNP,HIGH VOLTAGE

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
Q24	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q25	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q26	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q27	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q28	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q29	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q30	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q31	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q32	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R8	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R9	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R10	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R11	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R12	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R16	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R17	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R18	201-1652-00	RES,SMD,16.5K,1%,0.125W,+/-100PPM/C,1206
R19	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R20	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R59	201-1272-00	RES,SMD,12.7K,1.0%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R69	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R70	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R71	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R72	201-1213-00	RES,SMD,121K,1%,0.125W,1206
R73	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R74	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R75	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R76	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R77	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R81	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%

EU Drawing Designator (Dwg. #824-0261-00), EL Recharger Board 031-0046-00		
Reference Designator	Part Number	Description
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP1	225-0003-00	RES,POTENTIOMETER,10K,.5W,20%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP4	225-0005-00	RES,VARIABLE,500 OHM,0.5W,10%,AXIAL
RP5	228-0003-00	TRIM POT,10 TURNS,100K OHM
T1	360-0005-00	TRANSFORMER,EL DRIVER
T2	360-0006-00	TRANSFORMER,RECHARGER,W IN/OUT INDUCTORS
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR,SMD,33V,1500W
U1	474-0007-04	IC,LT1170CT,SWITCHING REGULATOR,100KHZ
U2	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U3	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U7	400-4060-03	IC,14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE,CLIPPARD
VLV2	680-0036-00	VALVE,AIR SOLENOID

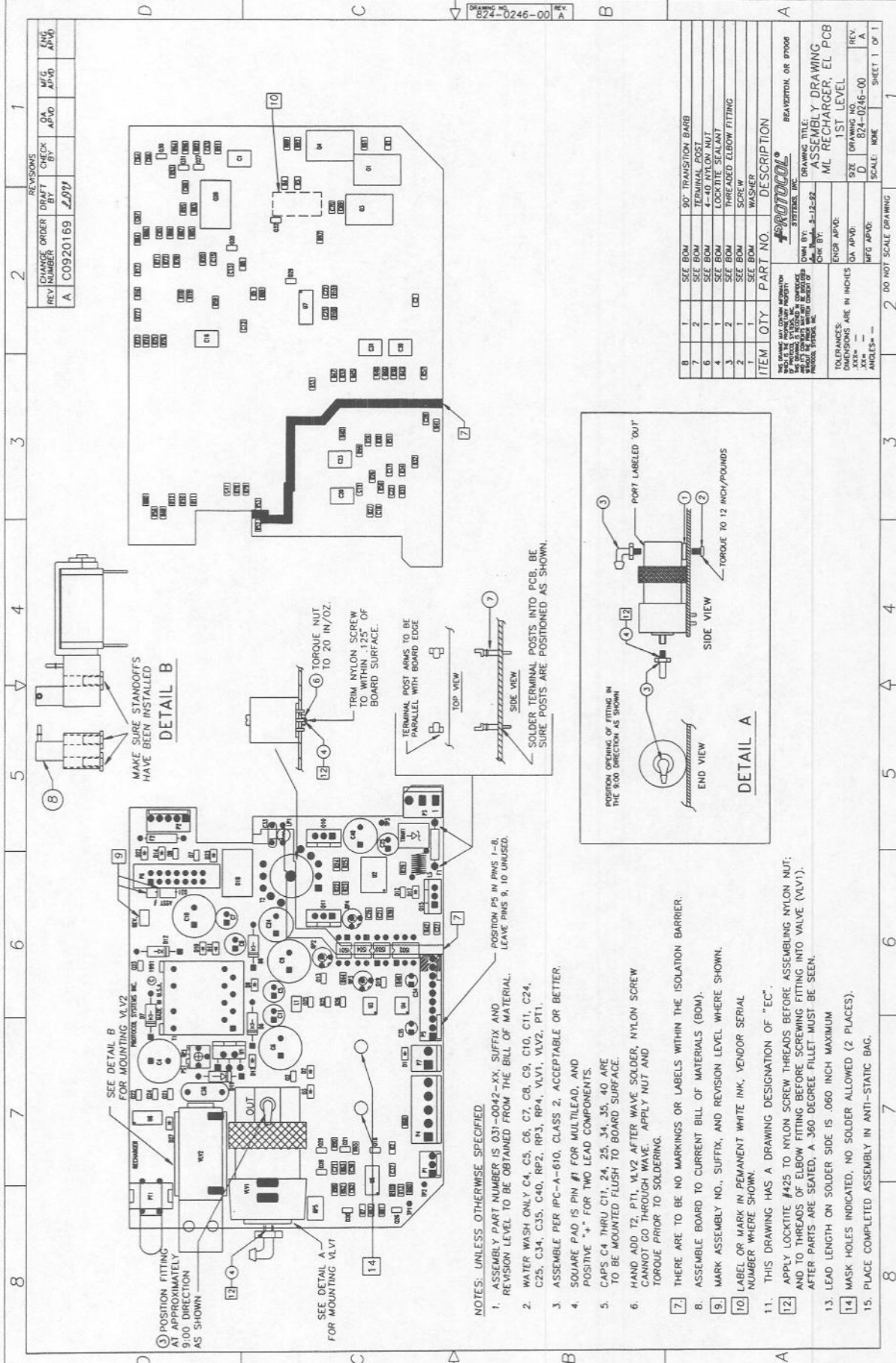
EV Drawing Designator (Dwg. #824-0260-00), LCD Recharger Board 031-0047-00		
Reference Designator	Part Number	Description
1	620-0025-00	WASHER, FIBER, .437 OD, .202 ID, .093 TH FOR NO. 10 SCREW
2	620-0026-00	SCREW, PAN HEAD, 10-32 X 5/16, PHILLIPS, SS MATERIAL PREFERRED
3	600-0004-00	THREADED ELL FITTING FOR 3/32" ID HOSE X 10-32 THREAD
4	650-0021-00	LOCTITE #425 THREAD SEALER
6	620-0019-00	NUT, HEX, 4-40, NYL
7	610-0126-00	SOLDER PIN TERMINAL
8	620-0177-00	90 DEGREE TRANSITION BARB
	030-0036-00	BARE PCB, M/L RECHARGER
	640-0265-00	LABEL, BAR CODE PCB
	800-0039-00	SCHEMATIC, M/L RECHARGER, LCD
	825-0030-00	REF. DWG, M/L, EL/LCD, HW AND SW COMPP. MATRIX
	824-0260-00	ASSY DWG, M/L RECHARGER PCB, LCD
C2	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C17	261-0027-00	CAP, SMD, CER, 330PF, 10%, 100V, COG, 1206
C18	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C24	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C25	250-0016-00	CAP, ELECTROLYTIC, 47UF, 50V, 105DEC C, +/-20%
C27	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C31	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C33	260-0001-00	CAP, CER, .01MFD, 200V, +/-20%
C34	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C35	250-0007-00	CAPACITOR, 100uFD, 10V, +/-20%, ALUMINUM ELECTROLYTIC
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C39	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C40	250-0021-00	CAP, 330MFD, 10X20, 35V, +/-20%
C41	261-0029-00	CAP, SMD, CER, 47PF, 200V, 5%, NPI, 1206
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C65	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

EV Drawing Designator (Dwg. #824-0260-00), LCD Recharger Board 031-0047-00		
Reference Designator	Part Number	Description
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C74	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C75	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C76	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C77	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C78	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C79	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C80	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C85	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C86	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D4	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D17	308-0015-08	DIODE,ZENER,10V,SMD,500MW
D18	307-0017-09	DIODE,POWER,DUAL,3AMP EA,200V
D21	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D24	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D25	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D26	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D28	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D29	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
F1	503-0008-00	FUSE, PICO, 3A, 125V
F2	503-0008-00	FUSE, PICO, 3A, 125V
ISO1	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO2	322-0002-00	OPTO COUPLER WITH SCR, DIP PKG
ISO3	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
ISO4	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
L3	350-0010-00	INDUCTOR,AIR CORE,150NH
LP1	500-0001-00	LAMP,NEON,A1C
P1	610-0022-00	HEADER, 3 PIN, .100 CENTERS
P2	610-0010-00	HEADER, 5 PIN,.100
P3	610-0109-00	HEADER,3 PIN,LOCKING,.156 CENTERS,SQUARE
P4	610-0035-00	PIN, 5 HEADER, .156 CENTER
P5	610-0013-00	HEADER, 8 PIN,.100
P6	610-0049-00	HEADER,2PIN,.100 CTR
P7	610-0024-00	HEADER, 2 PIN .156 CENTERS
P8	610-0020-00	HEADER, 2 PIN .100 CENTER, 1100-8-102-01
PS1	503-0042-00	INVERTER,MULTI LANGUAGE LCD

EV Drawing Designator (Dwg. #824-0260-00), LCD Recharger Board 031-0047-00		
Reference Designator	Part Number	Description
PT1	503-0047-00	PRESSURE TRANSDUCER
Q1	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q2	301-0003-10	TRANSISTOR,PNP DARLINGTON,MMBTA63,SOT23 PK
Q3	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q4	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q6	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q10	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q11	302-0007-00	XSTR,POWER FIELD EFFECT,MTP25N10E,T0-220
Q12	301-0005-10	TRANSISTOR,SMT,MMBT2907A,SOT-23 PKG
Q13	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q15	310-0001-04	SCR, 25A, 50V, (MCR69-2) TO-220 PKG, THRU HOLE
Q18	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q19	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q25	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q27	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q28	302-0006-00	XSTR,POWER MOS,N-CHANNEL,MTD10N05E,D-PAK
Q29	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q30	301-0010-10	XSTR,TP0610T,P-CHANNEL,MOSFET
Q31	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q32	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R2	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R3	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R4	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R7	203-2204-00	RESISTOR, SMT, 1206 PKG, 2.2 MEG 5%
R13	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R22	200-0008-01	RES,0.22 OHM,5%
R23	200-0008-01	RES,0.22 OHM,5%
R24	200-0008-01	RES,0.22 OHM,5%
R25	200-0008-01	RES,0.22 OHM,5%
R26	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R27	201-7501-00	RES,SMD,7.50K OHM,1%,0.125W,1206
R28	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R29	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R30	201-4221-00	RES,SMD,4.22K,1%,0.125W,+/-100PPM/C,1206
R31	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R32	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R33	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R34	201-1272-00	RES,SMD,12.7K,1.0%
R37	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R38	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R39	201-2941-00	RES,SMD,2.94K,1%,0.125W,100PPM,1206

EV Drawing Designator (Dwg. #824-0260-00), LCD Recharger Board 031-0047-00		
Reference Designator	Part Number	Description
R40	201-7500-00	RES,SMD,750 OHM,1%,0.125W,+/-100PPM/C,1206
R41	201-7502-00	RES,SMD,75.0K OHM,1206,1%
R42	201-1000-00	RES,SMD,100 OHM,1206,1%
R43	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R44	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R45	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R46	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R47	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R48	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R49	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R50	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R51	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R52	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R57	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R58	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R60	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R61	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R62	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R63	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R65	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R66	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R67	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R68	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R78	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R79	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R80	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R82	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R85	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R86	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R87	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R88	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R89	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R90	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R91	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R92	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R93	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R94	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R95	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R96	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%

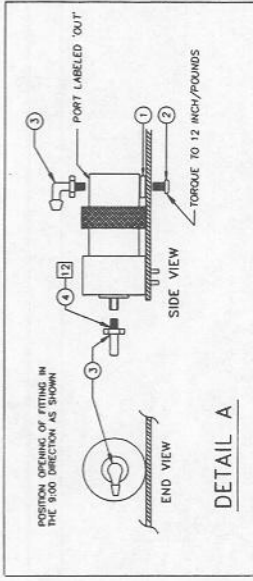
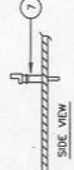
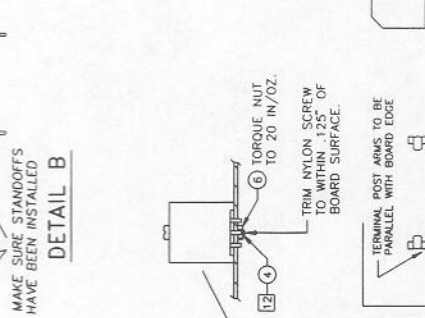
EV Drawing Designator (Dwg. #824-0260-00), LCD Recharger Board 031-0047-00		
Reference Designator	Part Number	Description
R97	203-1005-00	RESISTOR, SMT, 1206 PKG, 10 MEG 5%
R98	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R99	201-0000-00	RES,SMD,0 OHM,1206
R100	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R101	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R102	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
RP2	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP3	225-0001-00	RESISTOR, VARIABLE, 1K, .5W, 20%, AXIAL ADJUSTMENT
RP4	225-0005-00	RES,VARIABLE,500 OHM,0.5W,10%,AXIAL
RP5	228-0003-00	TRIM POT,10 TURNS,100K OHM
T2	360-0006-00	TRANSFORMER,RECHARGER,W IN/OUT INDUCTORS
TP2	503-0022-00	TEST TERMINAL
TP3	503-0022-00	TEST TERMINAL
TRAN1	311-0003-00	TRANSIENT SUPPRESSOR,SMD,33V,1500W
U2	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U3	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U4	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U5	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
U6	470-0014-03	IC,SMD,TLC27L9CD,OP AMP,LOW OFFSET,LOW POWER
U7	400-4060-03	IC,14 STAGE RIPPLE COUNTER W/OSCILLATOR
VLV1	680-0007-01	VALVE,CLIPPARD
VLV2	680-0036-00	VALVE,AIR SOLENOID



NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLY PART NUMBER IS 031-0042-XX. SUFFIX AND REVISION LEVEL TO BE OBTAINED FROM THE BILL OF MATERIAL.
2. WATER WASH ONLY C4, C5, C6, C7, C8, C9, C10, C11, C24, C25, C34, C35, C40, RP2, RP3, RP4, VLV1, VLV2, PT1.
3. ASSEMBLE PER IPC-A-610, CLASS 2, ACCEPTABLE OR BETTER.
4. SQUARE PAD IS PIN #1 FOR MULTILEAD, AND POSITIVE "A" FOR TWO LEAD COMPONENTS.
5. CAPS C4 THRU C11, 24, 25, 34, 35, 40 ARE TO BE MOUNTED FLUSH TO BOARD SURFACE.
6. HAND ADD T2, PT1, VLV2 AFTER WAVE SOLDER, NYLON SCREW CANNOT GO THROUGH WAVE. APPLY NUT AND TORQUE PRIOR TO SOLDERING.
7. THERE ARE TO BE NO MARKINGS OR LABELS WITHIN THE ISOLATION BARRIER.
8. ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
9. MARK ASSEMBLY NO., SUFFIX, AND REVISION LEVEL WHERE SHOWN.
10. LABEL OR MARK IN PERMANENT WHITE INK, VENDOR SERIAL NUMBER WHERE SHOWN.
11. THIS DRAWING HAS A DRAWING DESIGNATION OF "EC".
12. APPLY LOCKTITE #425 TO NYLON SCREW THREADS BEFORE ASSEMBLING NYLON NUT; AND TO THREADS OF ELBOW FITTING BEFORE SCREWING FITTING INTO VALVE (VLV1). AFTER PARTS ARE SEATED, A 360 DEGREE FILLET MUST BE SEEN.
13. LEAD LENGTH ON SOLDER SIDE IS .060 INCH MAXIMUM
14. MASK HOLES INDICATED, NO SOLDER ALLOWED (2 PLACES).
15. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG.

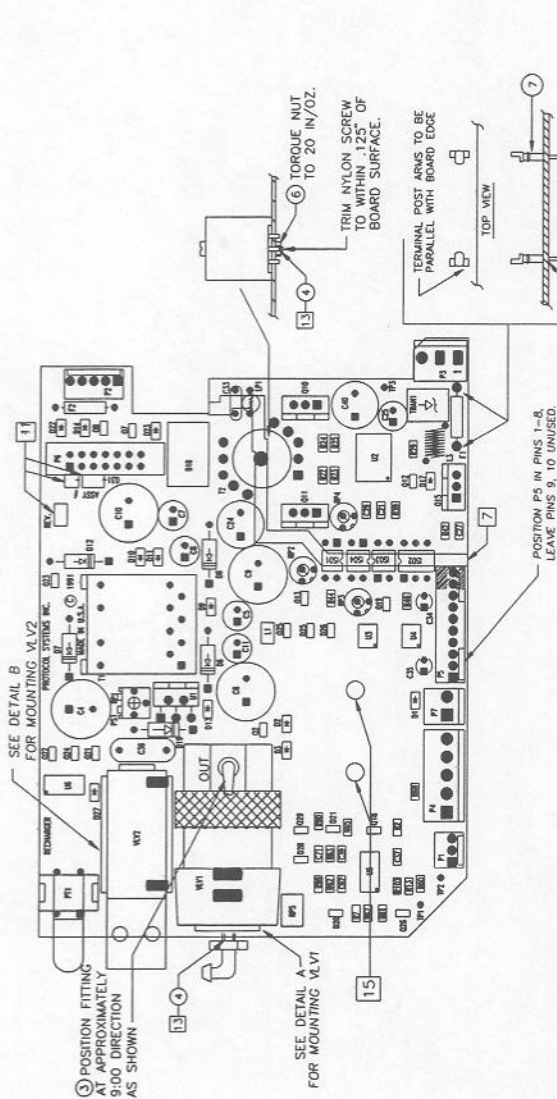
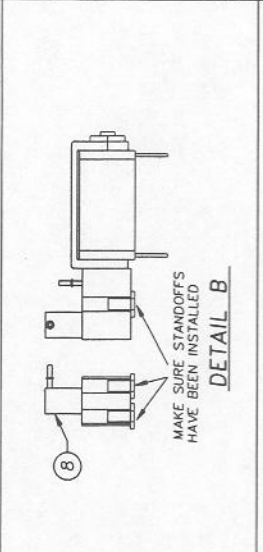
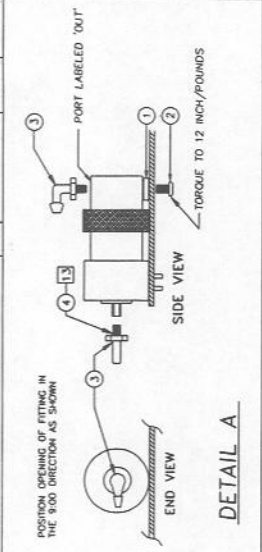
DETAIL B



ITEM	QTY	PART NO.	DESCRIPTION
8	1	SEE BOM	90° TRANSITION BARB
7	2	SEE BOM	90° ELBOW
6	1	SEE BOM	4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
3	2	SEE BOM	THREADED ELBOW FITTING
2	1	SEE BOM	SCREW
1	1	SEE BOM	WASHER

NO SHOWN OR OTHER INFORMATION		BEAVERTON OR PPOB	
DRAWN BY: STAFFORD, INC.		DRAWING TITLE:	
CHK BY: 5-12-92		ASSEMBLY DRAWING	
ENGR APVD:		ML RECHARGER, EL PCB	
DIA APVD:		1ST LEVEL	
MFG APVD:		REV	
SCALE: NONE		SHEET 1 OF 1	

REVISIONS			
REV	WHY/CHANGE ORDER NUMBER	DRAWN BY	CHECKED BY
A	CO 920413	JNO	CLG
B	CO920470	CLG	11/30/92



NOTES: UNLESS OTHERWISE SPECIFIED.

1. ASSEMBLY PART NUMBER IS 031-0042-XX, SUFFIX AND REVISION LEVEL TO BE OBTAINED FROM THE BILL OF MATERIAL.
2. WATER WASH ONLY C4, C5, C6, C7, C8, C9, C10, C11, C24, C25, C34, C35, C40, RP2, RP3, RP4, VLV1, VLV2, PT1.
3. ASSEMBLE PER IPC-A-610, CLASS 2, ACCEPTABLE OR BETTER.
4. SQUARE PAD IS PIN #1 FOR MULTILEAD, AND POSITIVE "+" FOR TWO LEAD COMPONENTS.
5. CAPS C4 THRU C11, 24, 25, 34, 35, 40 ARE TO BE MOUNTED FLUSH TO BOARD SURFACE.
6. HAND ADD T2, PT1, VLV2 AFTER WAVE SOLDER, NYLON SCREW CANNOT GO THROUGH WAVE. APPLY NUT AND TORQUE PRIOR TO SOLDERING.

7. THERE ARE TO BE NO MARKINGS OR LABELS WITHIN THE ISOLATION BARRIER.
8. PLACE BAR CODE LABEL WITH VENDOR SERIAL NUMBER AS SHOWN. PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QTY AND REV LEVEL NOT REQUIRED WITH DUPLICATE LABEL.

9. BAR CODE REQUIREMENTS:

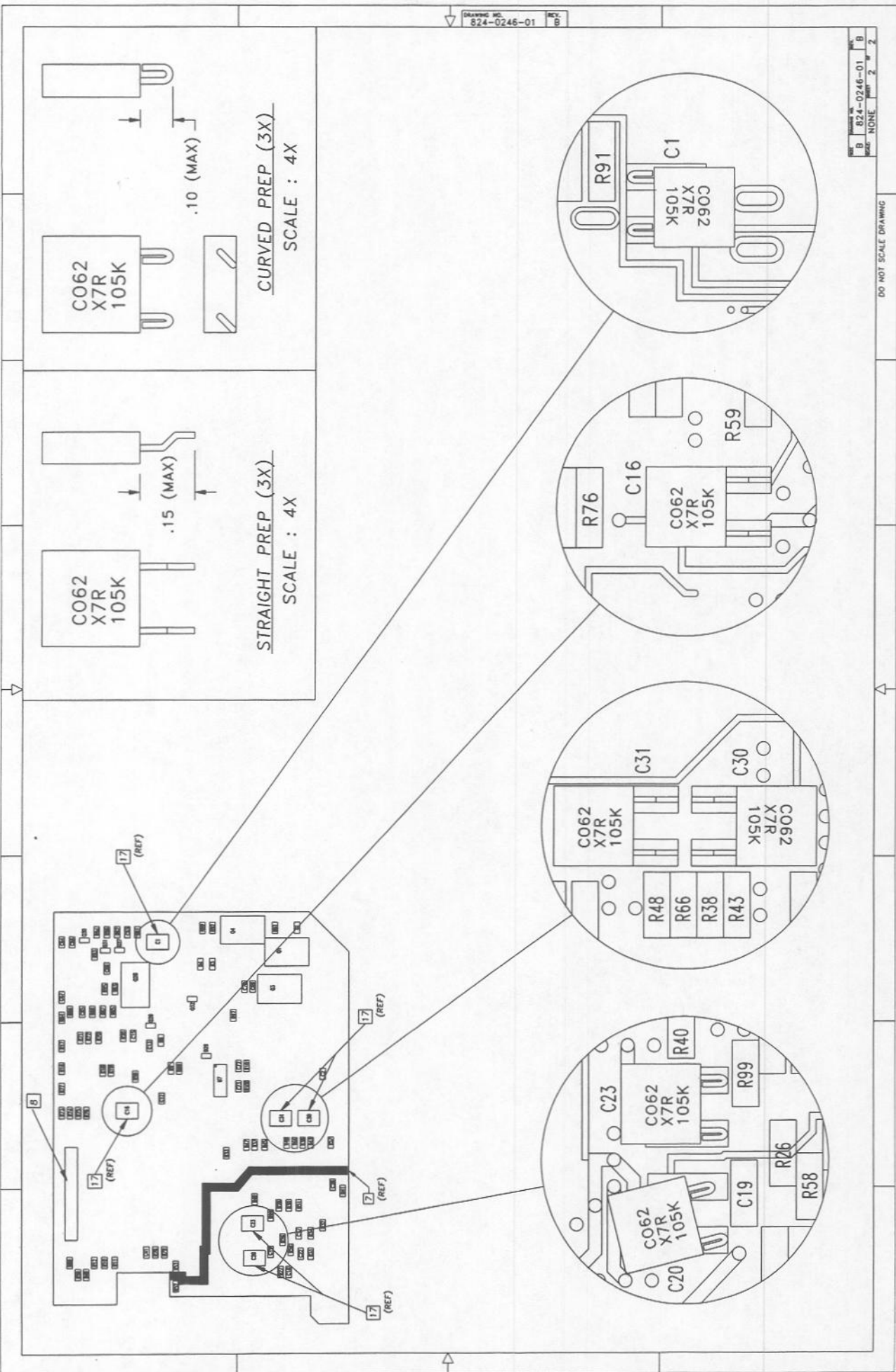
- CODE 39
- REV. LEVEL (NOT REQUIRED WITH DUPLICATE LABEL)
- QUANTITY (NOT REQUIRED WITH DUPLICATE LABEL)
- THREE DIGIT SERIAL NUMBER
- FOUR DIGIT LOT CODE NUMBER
- VENDOR I.D.

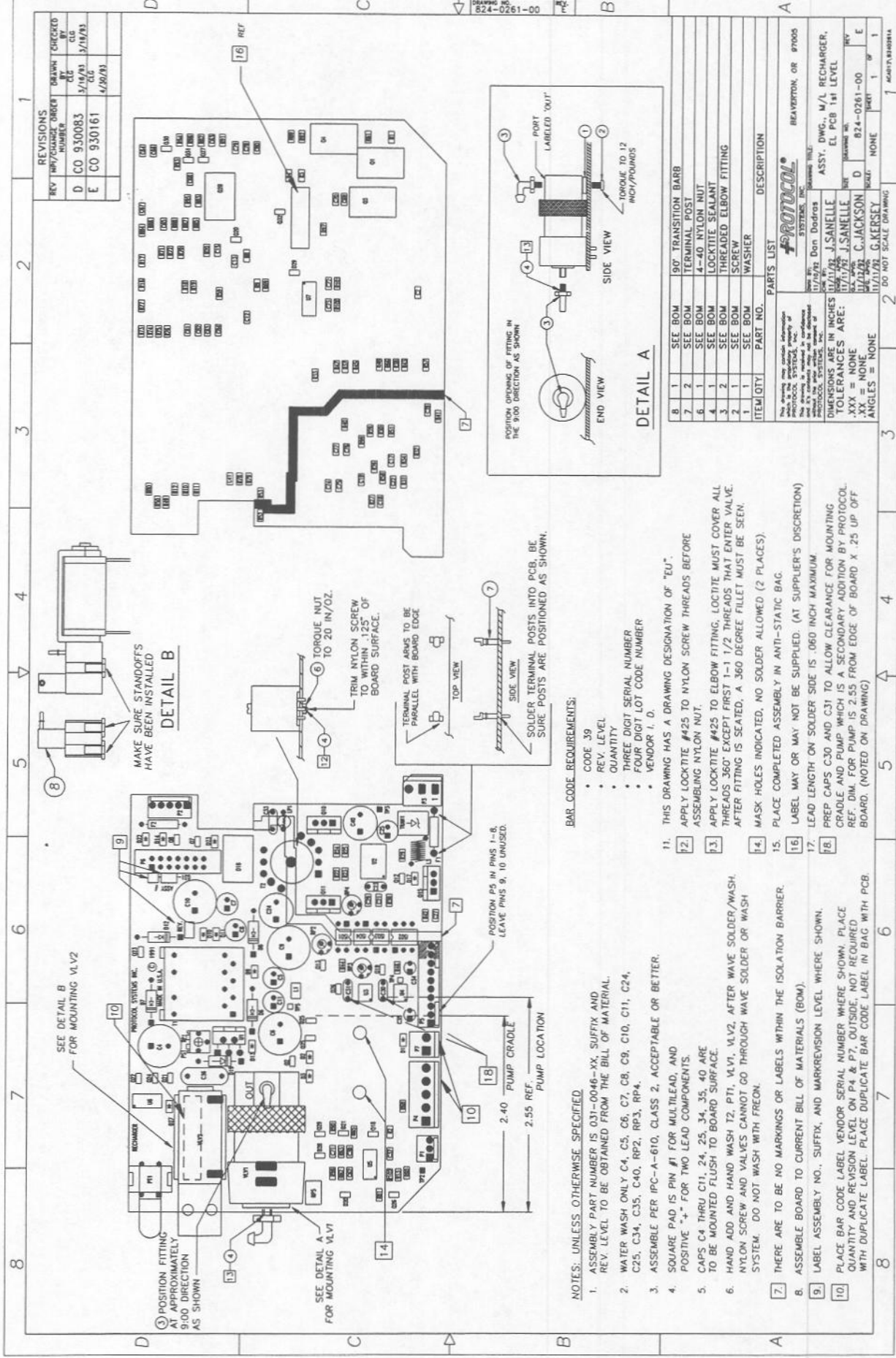
10. ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
11. MARK ASSEMBLY NO., SUFFIX, AND REVISION LEVEL WHERE SHOWN.
12. THIS DRAWING HAS A DRAWING DESIGNATION OF "EQ".
13. APPLY LOCKTITE #425 TO NYLON SCREW THREADS BEFORE ASSEMBLING NYLON NUT; AND TO THREADS OF ELBOW FITTING BEFORE SCREWING FITTING INTO VALVE (VLV1). AFTER PARTS ARE SEATED, A 360 DEGREE FILLET MUST BE SEEN.
14. LEAD LENGTH ON SOLDER SIDE IS .060 INCH MAXIMUM
15. MASK HOLES INDICATED, NO SOLDER ALLOWED (2 PLACES).
16. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG.
17. HAND ADD C1, C16, C20, C23, C30, AND C31 AFTER WAVE SOLDER. MAXIMUM BODY HEIGHT .120" ABOVE CIRCUIT BOARD.

ITEM	QTY	PART NO.	DESCRIPTION
8	1	SEE BOM	90° TRANSITION BARB
7	2	SEE BOM	TERMINAL POST
6	1	SEE BOM	4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
3	2	SEE BOM	THREADED ELBOW FITTING
2	1	SEE BOM	SCREW
1	1	SEE BOM	WASHER

PARTS LIST			
ITEM	QTY	PART NO.	DESCRIPTION
PROTOCOL SYSTEMS, INC.			
BEAVERTON, OR 97005			
ASSY. DWG., M/L RECHARGER, EL PCB 1st LEVEL			
DIMENSIONS ARE IN INCHES			
TOLERANCES ARE:			
.XXX = ± NONE			
.XX = ±			
.X = ±			
ANGLES = ±			
DO NOT SCALE DRAWING			

DO NOT SCALE DRAWING





NOTES: UNLESS OTHERWISE SPECIFIED

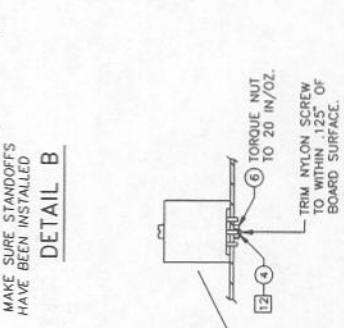
1. ASSEMBLY PART NUMBER IS 031-0046-XX, SUFFIX AND REV. LEVEL TO BE OBTAINED FROM THE BILL OF MATERIAL.
2. WATER WASH ONLY C4, C5, C6, C7, C8, C9, C10, C11, C24, C25, C34, C35, C40, RP2, RP3, RP4.
3. ASSEMBLE PER IPC-A-610, CLASS 2, ACCEPTABLE OR BETTER.
4. SQUARE PAD IS PIN #1 FOR MULTILEAD, AND POSITIVE "+" FOR TWO LEAD COMPONENTS.
5. CAPS C4 THRU C11, 24, 25, 34, 35, 40 ARE TO BE MOUNTED FLUSH TO BOARD SURFACE.
6. HAND ADD AND HAND WASH T2, PT1, VL1, VL2, AFTER WAVE SOLDER/WASH. NYLON SCREW AND VALVES CANNOT GO THROUGH WAVE SOLDER OR WASH SYSTEM. DO NOT WASH WITH FREON.
7. THERE ARE TO BE NO MARKINGS OR LABELS WITHIN THE ISOLATION BARRIER.
8. ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
9. LABEL ASSEMBLY NO., SUFFIX, AND MARKREVISION LEVEL WHERE SHOWN.
10. PLACE BAR CODE LABEL VENDOR SERIAL NUMBER WHERE SHOWN. PLACE QUANTITY AND REVISION LEVEL ON P4 & P7, OUTSIDE, NOT REQUIRED WITH DUPLICATE LABEL. PLACE DUPLICATE BAR CODE LABEL IN BAG WITH PCB

BAR CODE REQUIREMENTS:

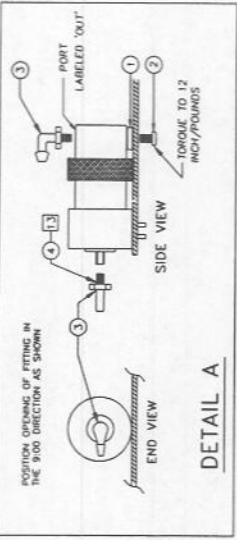
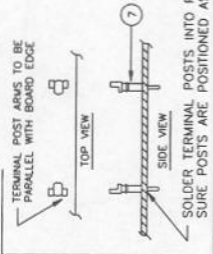
- CODE 39
- REV. LEVEL
- QUANTITY
- THREE DIGIT SERIAL NUMBER
- FOUR DIGIT LOT CODE NUMBER
- VENDOR I. O.

11. THIS DRAWING HAS A DRAWING DESIGNATION OF "EU".
12. APPLY LOCKTITE #425 TO NYLON SCREW THREADS BEFORE ASSEMBLING NYLON NUT.
13. APPLY LOCKTITE #425 TO ELBOW FITTING, LOCKTITE MUST COVER ALL THREADS 360° EXCEPT FIRST 1-1/2 THREADS THAT ENTER VALVE. AFTER FITTING IS SEATED, A 360 DEGREE FILLET MUST BE SEEN.
14. MASK HOLES INDICATED, NO SOLDER ALLOWED (2 PLACES).
15. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG.
16. LABEL MAY OR MAY NOT BE SUPPLIED. (AT SUPPLIER'S DISCRETION)
17. LEAD LENGTH ON SOLDER SIDE IS .060 INCH MAXIMUM.
18. PREP CAPS C30 AND C31 TO ALLOW CLEARANCE FOR MOUNTING CRADLE AND PUMP WHICH IS A SECONDARY ADDITION BY PROTOCOL. REF. DIM. FOR PUMP IS 2.55 FROM EDGE OF BOARD X .25 UP OFF BOARD. (NOTED ON DRAWING)

DETAIL B



DETAIL A



DETAIL A

ITEM	QTY	PART NO.	DESCRIPTION
1	1	SEE BOM	90° TRANSITION BARB
2	1	SEE BOM	TERMINAL POST
3	1	SEE BOM	4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
5	1	SEE BOM	THREADED ELBOW FITTING
6	1	SEE BOM	SCREW
7	1	SEE BOM	WASHER

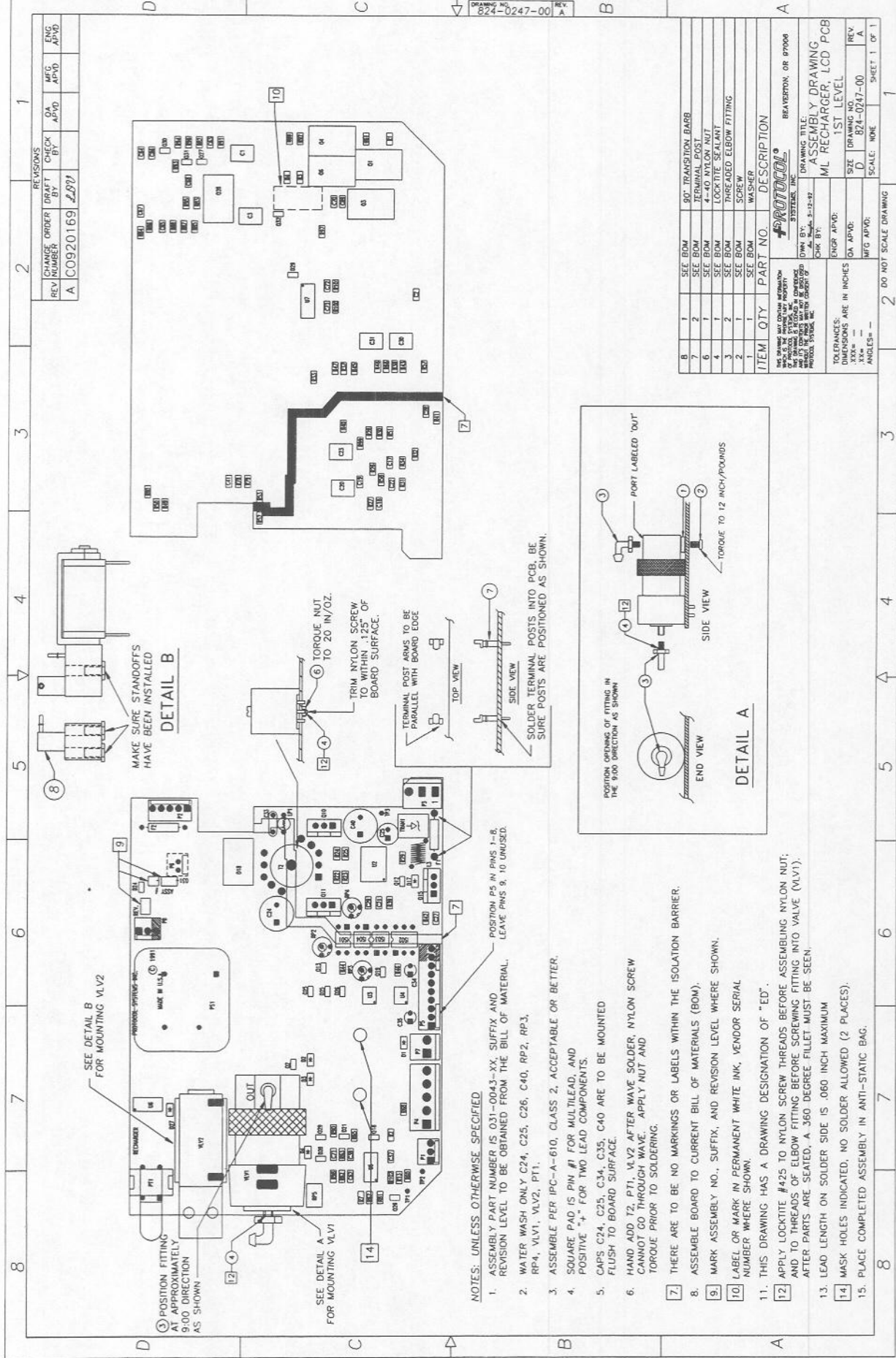
PARTS LIST

ITEM	QTY	PART NO.	DESCRIPTION
1	1	SEE BOM	90° TRANSITION BARB
2	1	SEE BOM	TERMINAL POST
3	1	SEE BOM	4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
5	1	SEE BOM	THREADED ELBOW FITTING
6	1	SEE BOM	SCREW
7	1	SEE BOM	WASHER

REV	DATE	BY	CHKD	REASON
D	CO 930083	3/19/93	CLG	
E	CO 930161	4/9/93	CLG	

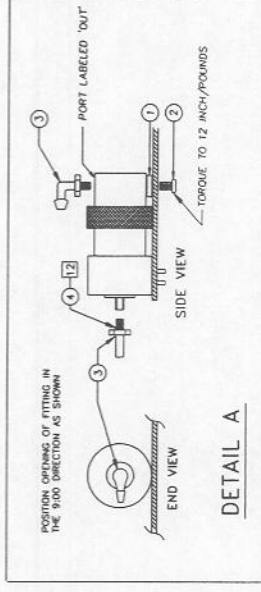
PROTOCOL SYSTEMS, INC.

ITEM	QTY	PART NO.	DESCRIPTION
1	1	SEE BOM	90° TRANSITION BARB
2	1	SEE BOM	TERMINAL POST
3	1	SEE BOM	4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
5	1	SEE BOM	THREADED ELBOW FITTING
6	1	SEE BOM	SCREW
7	1	SEE BOM	WASHER

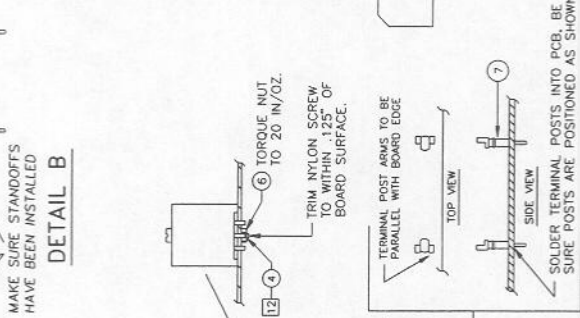


NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLY PART NUMBER IS 031-0043-XX, SUFFIX AND REVISION LEVEL TO BE OBTAINED FROM THE BILL OF MATERIAL.
2. WATER WASH ONLY C24, C25, C26, C40, RP2, RP3, RP4, VLV1, VLV2, PT1.
3. ASSEMBLE PER IPC-A-610, CLASS 2, ACCEPTABLE OR BETTER.
4. SQUARE PAD IS PIN #1 FOR MULTILEAD, AND POSITIVE "+" FOR TWO LEAD COMPONENTS.
5. CAPS C24, C25, C34, C35, C40 ARE TO BE MOUNTED FLUSH TO BOARD SURFACE.
6. HAND ADD T2, PT1, VLV2 AFTER WAVE SOLDER, NYLON SCREW CANNOT GO THROUGH WAVE. APPLY NUT AND TORQUE PRIOR TO SOLDERING.
7. THERE ARE TO BE NO MARKINGS OR LABELS WITHIN THE ISOLATION BARRIER.
8. ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
9. MARK ASSEMBLY NO., SUFFIX, AND REVISION LEVEL WHERE SHOWN.
10. LABEL OR MARK IN PERMANENT WHITE INK, VENDOR SERIAL NUMBER WHERE SHOWN.
11. THIS DRAWING HAS A DRAWING DESIGNATION OF "ED".
12. APPLY LOCKTITE #425 TO NYLON SCREW THREADS BEFORE ASSEMBLING NYLON NUT; AND TO THREADS OF ELBOW FITTING BEFORE SCREWING FITTING INTO VALVE (VLV1). AFTER PARTS ARE SEATED, A 360 DEGREE FILLET MUST BE SEEN.
13. LEAD LENGTH ON SOLDER SIDE IS .060 INCH MAXIMUM
14. MASK HOLES INDICATED, NO SOLDER ALLOWED (2 PLACES).
15. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG.

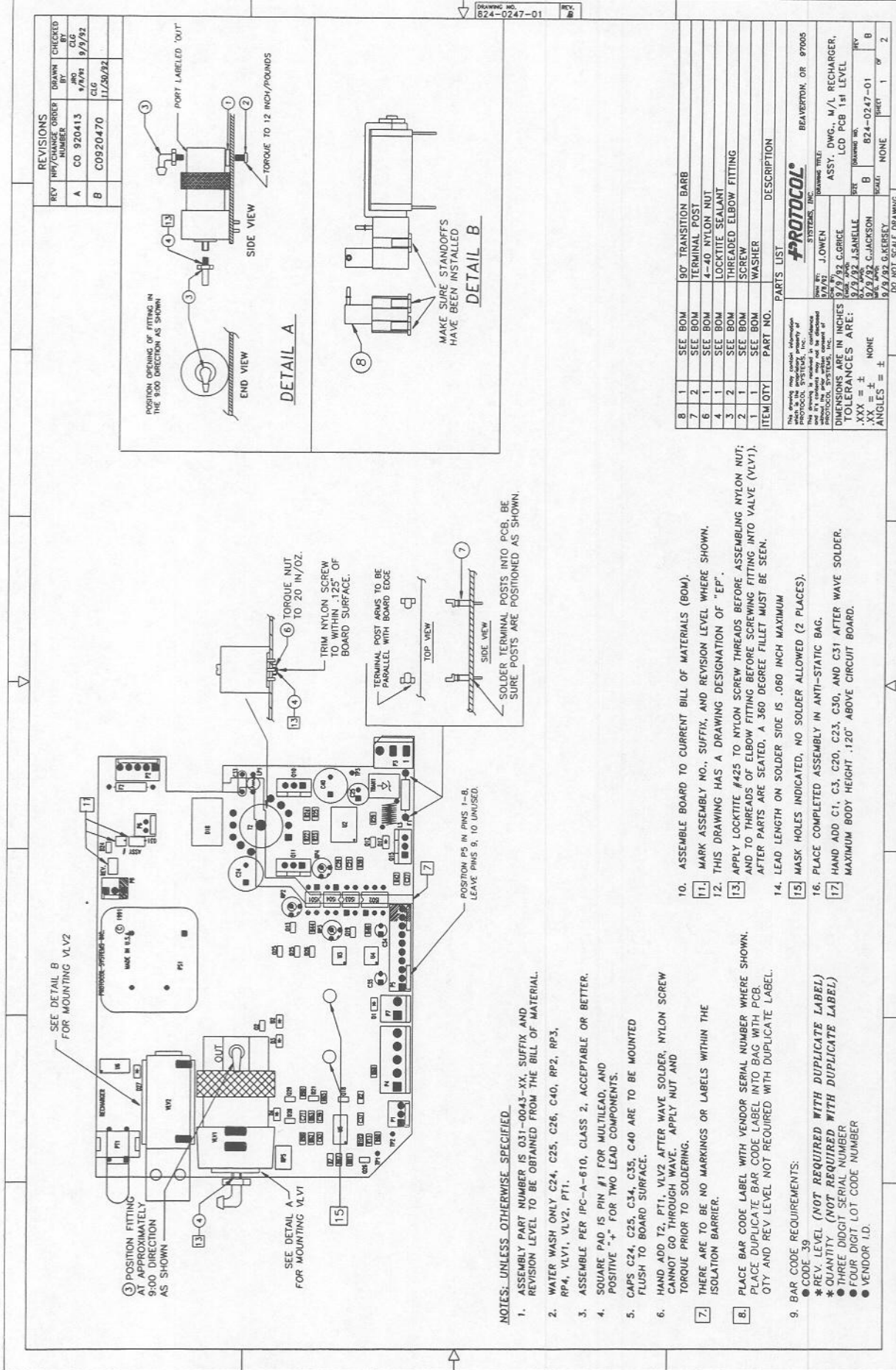


DETAIL B



ITEM	QTY	PART NO.	DESCRIPTION
1	1	SEE BOM	WASHER
2	1	SEE BOM	SCREW
3	1	SEE BOM	THREADED ELBOW FITTING
4	1	SEE BOM	LOCK TITE SEALANT
5	1	SEE BOM	4-40 NYLON NUT
6	1	SEE BOM	90° TRANSITION BARB
7	1	SEE BOM	TRIM NYLON SCREW
8	1	SEE BOM	TERMINAL POST
9	1	SEE BOM	TORQUE NUT
10	1	SEE BOM	TRIM NYLON SCREW
11	1	SEE BOM	TERMINAL POST
12	1	SEE BOM	TORQUE NUT
13	1	SEE BOM	TRIM NYLON SCREW
14	1	SEE BOM	TERMINAL POST
15	1	SEE BOM	TORQUE NUT

PROLOG
SYSTEMS, INC.
DRAWING TITLE
ML RECHARGER, LCD PCB
DRAWING NO.
031-0043-00
REV. 1
DATE
02-14-00
SCALE
N/A
SHEET 1 OF 1



NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLY PART NUMBER IS 031-0043-XX, SUFFIX AND REVISION LEVEL TO BE OBTAINED FROM THE BILL OF MATERIAL.
2. WATER WASH ONLY C24, C25, C26, C40, RP2, RP3, RP4, VLV1, VLV2, PT1.
3. ASSEMBLE PER IPC-A-610, CLASS 2, ACCEPTABLE OR BETTER.
4. SQUARE PAD IS PIN #1 FOR MULTILEAD, AND POSITIVE "+" FOR TWO LEAD COMPONENTS.
5. CAPS C24, C25, C34, C35, C40 ARE TO BE MOUNTED FLUSH TO BOARD SURFACE.
6. HAND ADD T2, PT1, VLV2 AFTER WAVE SOLDER, NYLON SCREW CANNOT GO THROUGH WAVE. APPLY NUT AND TORQUE PRIOR TO SOLDERING.
7. THERE ARE TO BE NO MARKINGS OR LABELS WITHIN THE ISOLATION BARRIER.

8. PLACE BAR CODE LABEL WITH VENDOR SERIAL NUMBER WHERE SHOWN. PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QTY AND REV LEVEL NOT REQUIRED WITH DUPLICATE LABEL.

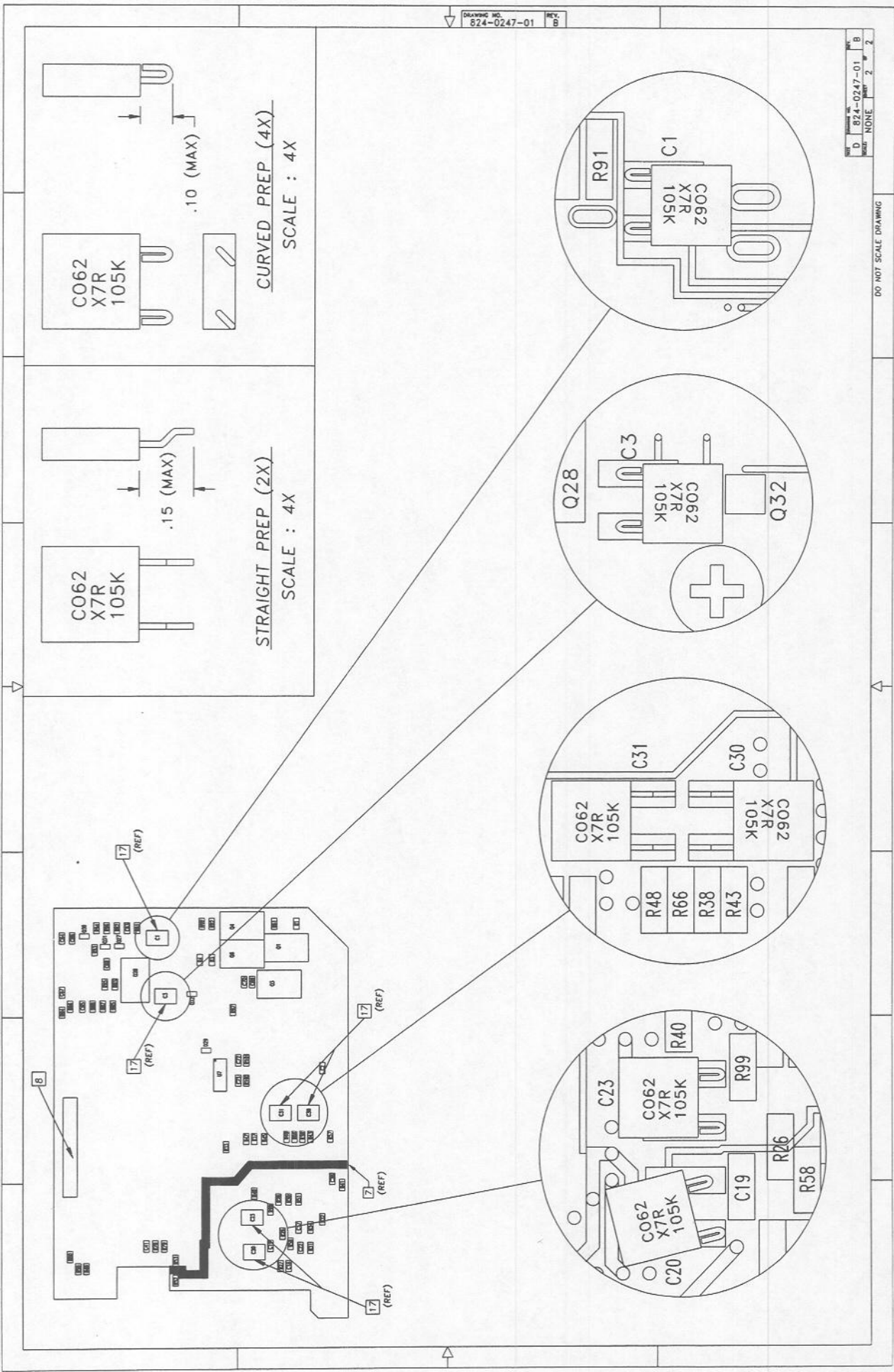
9. BAR CODE REQUIREMENTS:
 - CODE 39
 - REV. LEVEL
 - QUANTITY (NOT REQUIRED WITH DUPLICATE LABEL)
 - THREE DIGIT SERIAL NUMBER
 - FOUR DIGIT LOT CODE NUMBER
 - VENDOR I.D.

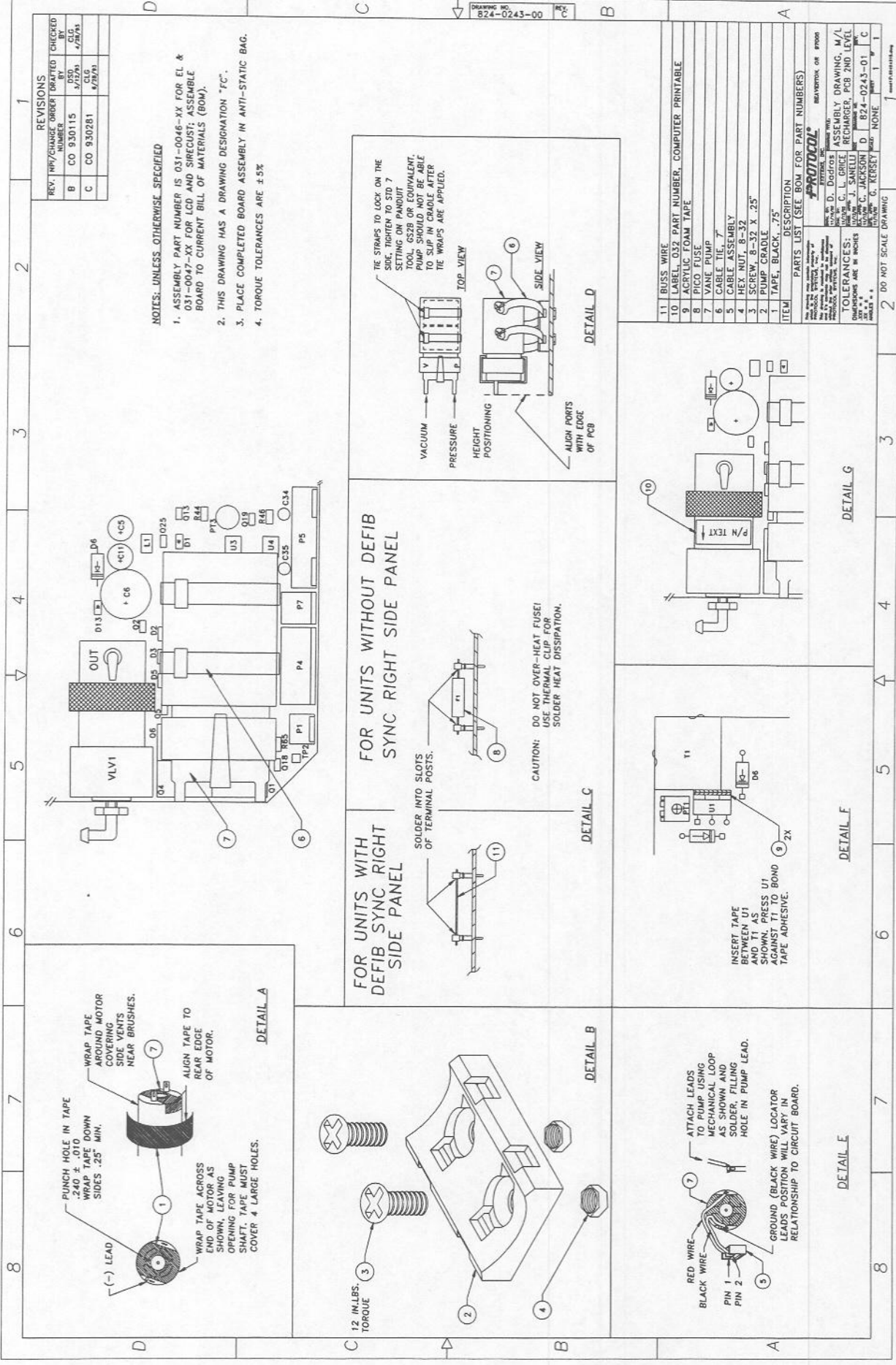
10. ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
11. MARK ASSEMBLY NO., SUFFIX, AND REVISION LEVEL WHERE SHOWN.
12. THIS DRAWING HAS A DRAWING DESIGNATION OF "EP".
13. APPLY LOCKTITE #425 TO NYLON SCREW THREADS BEFORE ASSEMBLING NYLON NUT; AND TO THREADS OF ELBOW FITTING BEFORE SCREWING FITTING INTO VALVE (VLV1). AFTER PARTS ARE SEATED, A 360 DEGREE FILLET MUST BE SEEN.
14. LEAD LENGTH ON SOLDER SIDE IS .080 INCH MAXIMUM
15. MASK HOLES INDICATED, NO SOLDER ALLOWED (2 PLACES).
16. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG.
17. HAND ADD C1, C3, C20, C23, C30, AND C31 AFTER WAVE SOLDER. MAXIMUM BODY HEIGHT .120" ABOVE CIRCUIT BOARD.

ITEM	QTY	PART NO.	DESCRIPTION
8	1	SEE BOM	90° TRANSITION BARB
7	2	SEE BOM	TERMINAL POST
6	1	SEE BOM	1/4-40 NYLON NUT
4	1	SEE BOM	LOCKTITE SEALANT
3	2	SEE BOM	THREADED ELBOW FITTING
2	2	SEE BOM	SCREW
1	1	SEE BOM	WASHER

ITEM	QTY	PART NO.	DESCRIPTION
PARTS LIST			
PROTOCOL SYSTEMS, INC.			
BEAVERTON, OR 97005			
DRAWING TITLE			
ASSY. DWG., M/L RECHARGER, LCD PCB 1st LEVEL			
DIMENSIONS ARE IN INCHES			
TOLERANCES ARE:			
XX = ±			
XX = ±			
XX = ±			
ANGLES = ±			
DO NOT SCALE DRAWING			

DO NOT SCALE DRAWING





REVISIONS		CHECKED BY	
REV.	DATE/CHANGE	NUMBER	BY
B	CO 930115	050	CLG
C	CO 930281	050	CLG

NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLY PART NUMBER IS 031-0046-XX FOR EL & 031-0047-XX FOR LCD AND SIRECUST; ASSEMBLE BOARD TO CURRENT BILL OF MATERIALS (BOM).
2. THIS DRAWING HAS A DRAWING DESIGNATION "FC".
3. PLACE COMPLETED BOARD ASSEMBLY IN ANTI-STATIC BAG.
4. TORQUE TOLERANCES ARE $\pm 5\%$.

PARTS LIST (SEE BOM FOR PART NUMBERS)	
ITEM	DESCRIPTION
1	TAPE, BLACK, .75"
2	PUMP CRADLE
3	SCREW, 8-32 X .25"
4	HEX NUT, 8-32
5	CABLE ASSEMBLY
6	CABLE TIE, .7"
7	VACUUM PUMP
8	ACRYLIC FOAM TAPE
9	BUSS WIRE
10	LABEL, 032 PART NUMBER, COMPUTER PRINTABLE
11	BUSS WIRE

TOLERANCES:	
DIMENSIONS ARE IN INCHES	DECIMALS
0.005	0.005
0.010	0.010
0.015	0.015
0.020	0.020
0.030	0.030
0.040	0.040
0.050	0.050
0.060	0.060
0.070	0.070
0.080	0.080
0.090	0.090
0.100	0.100
0.125	0.125
0.150	0.150
0.175	0.175
0.200	0.200
0.250	0.250
0.300	0.300
0.375	0.375
0.500	0.500
0.625	0.625
0.750	0.750
1.000	1.000
1.250	1.250
1.500	1.500
2.000	2.000
2.500	2.500
3.000	3.000
3.750	3.750
4.000	4.000
5.000	5.000
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7.000	7.000
8.000	8.000
9.000	9.000
10.000	10.000

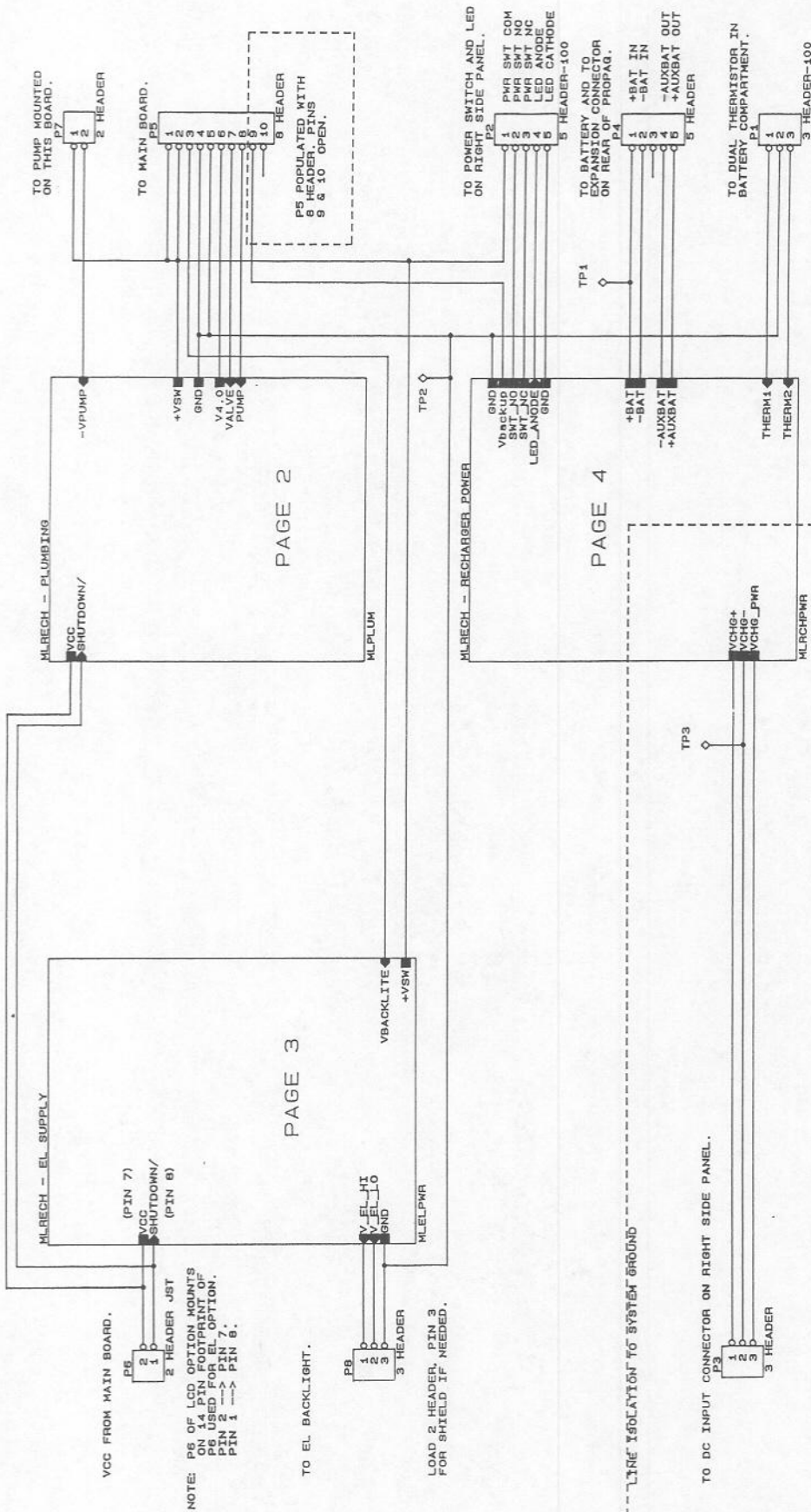
FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL	
DETAIL A	DETAIL B
<p>FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL</p> <p>SOLDER INTO SLOTS OF TERMINAL POSTS.</p> <p>CAUTION: DO NOT OVER-HEAT FUSE! USE THERMAL CLIP FOR SOLDER HEAT DISSIPATION.</p>	<p>FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL</p> <p>THE STRAPS TO LOCK ON THE SIDE, TIGHTEN TO STD 7 SETTING ON PANDUIT TOOL, GS28 OR EQUIVALENT. PUMP SHOULD NOT BE ABLE TO SLIP IN CRADLE AFTER THE WRAPS ARE APPLIED.</p>

FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL	
DETAIL C	DETAIL D
<p>FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL</p> <p>THE STRAPS TO LOCK ON THE SIDE, TIGHTEN TO STD 7 SETTING ON PANDUIT TOOL, GS28 OR EQUIVALENT. PUMP SHOULD NOT BE ABLE TO SLIP IN CRADLE AFTER THE WRAPS ARE APPLIED.</p>	<p>FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL</p> <p>SOLDER INTO SLOTS OF TERMINAL POSTS.</p> <p>CAUTION: DO NOT OVER-HEAT FUSE! USE THERMAL CLIP FOR SOLDER HEAT DISSIPATION.</p>

FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL	
DETAIL E	DETAIL F
<p>FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL</p> <p>SOLDER INTO SLOTS OF TERMINAL POSTS.</p> <p>CAUTION: DO NOT OVER-HEAT FUSE! USE THERMAL CLIP FOR SOLDER HEAT DISSIPATION.</p>	<p>FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL</p> <p>THE STRAPS TO LOCK ON THE SIDE, TIGHTEN TO STD 7 SETTING ON PANDUIT TOOL, GS28 OR EQUIVALENT. PUMP SHOULD NOT BE ABLE TO SLIP IN CRADLE AFTER THE WRAPS ARE APPLIED.</p>

FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL	
DETAIL G	DETAIL H
<p>FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL</p> <p>THE STRAPS TO LOCK ON THE SIDE, TIGHTEN TO STD 7 SETTING ON PANDUIT TOOL, GS28 OR EQUIVALENT. PUMP SHOULD NOT BE ABLE TO SLIP IN CRADLE AFTER THE WRAPS ARE APPLIED.</p>	<p>FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL</p> <p>SOLDER INTO SLOTS OF TERMINAL POSTS.</p> <p>CAUTION: DO NOT OVER-HEAT FUSE! USE THERMAL CLIP FOR SOLDER HEAT DISSIPATION.</p>

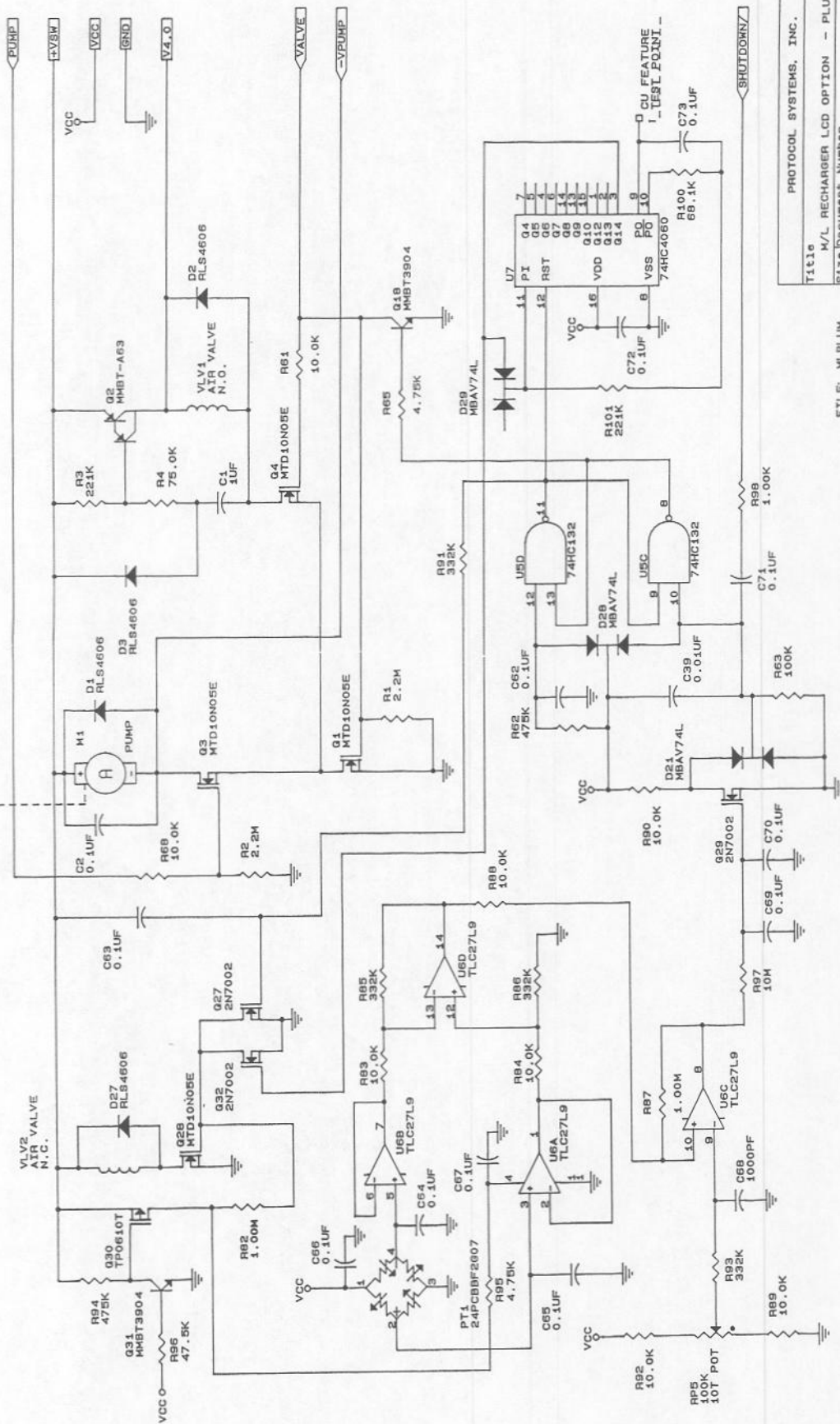
FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL	
DETAIL I	DETAIL J
<p>FOR UNITS WITH DEFIB SYNC RIGHT SIDE PANEL</p> <p>SOLDER INTO SLOTS OF TERMINAL POSTS.</p> <p>CAUTION: DO NOT OVER-HEAT FUSE! USE THERMAL CLIP FOR SOLDER HEAT DISSIPATION.</p>	<p>FOR UNITS WITHOUT DEFIB SYNC RIGHT SIDE PANEL</p> <p>THE STRAPS TO LOCK ON THE SIDE, TIGHTEN TO STD 7 SETTING ON PANDUIT TOOL, GS28 OR EQUIVALENT. PUMP SHOULD NOT BE ABLE TO SLIP IN CRADLE AFTER THE WRAPS ARE APPLIED.</p>



Title		M/L RECHARGER LCD OPTION - HIERARCHY	
Size	Document Number	REV	
B	800-0033-00	A	
Date:	JUNE 3, 1992	Sheet	1 of 4

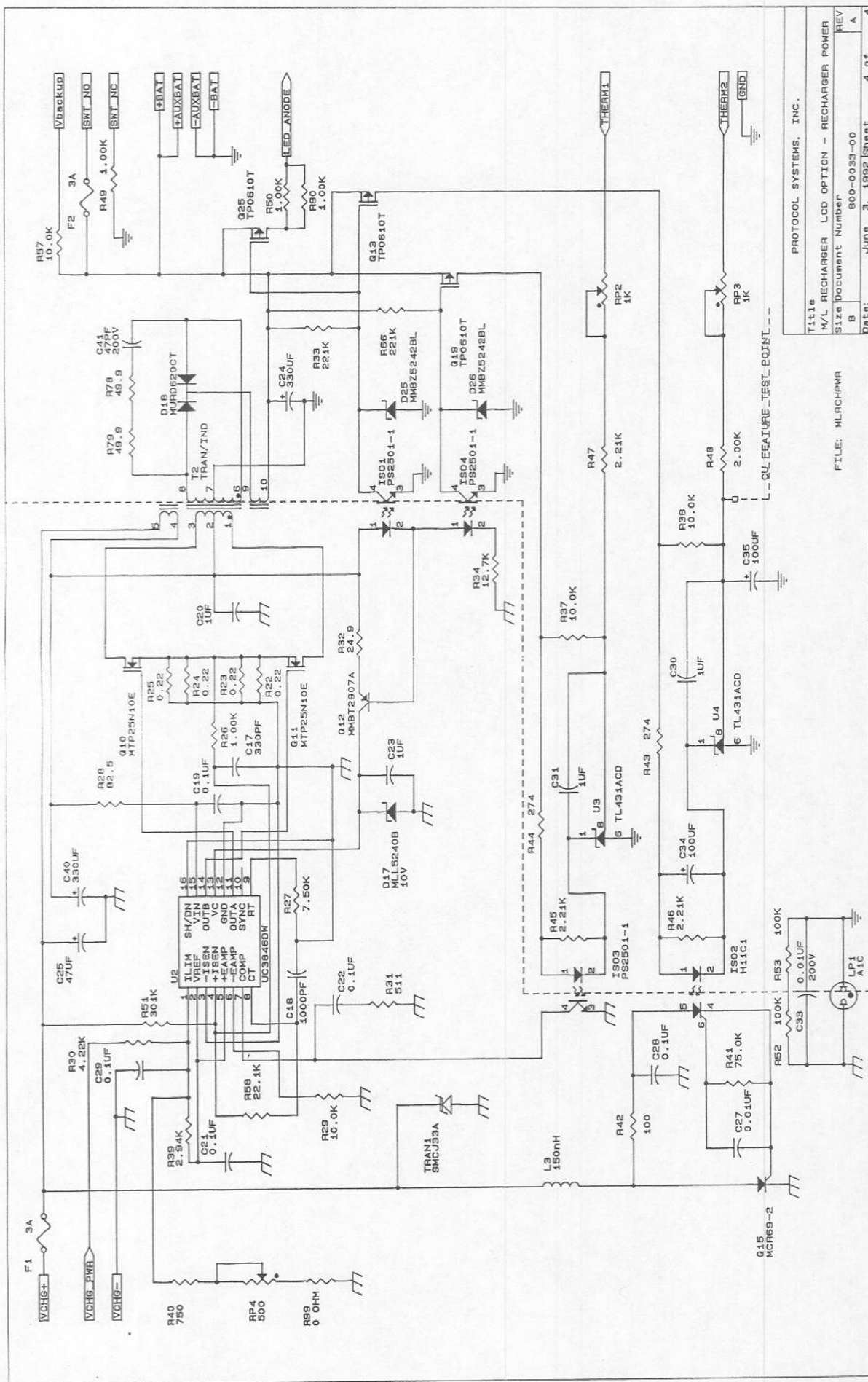
PROTOCOL SYSTEMS, INC.

NOTE: M1 SHOWN FOR CLARITY, ELECTRICALLY CONNECTED THROUGH P7.



Title		PROTOCOL SYSTEMS, INC.
M/L RECHARGER LCD OPTION - PLUMBING		
Size	Document Number	800-0033-00
REV		A
Date:	June 3, 1992	Sheet 2 of 4

FILE: M/LPLUM

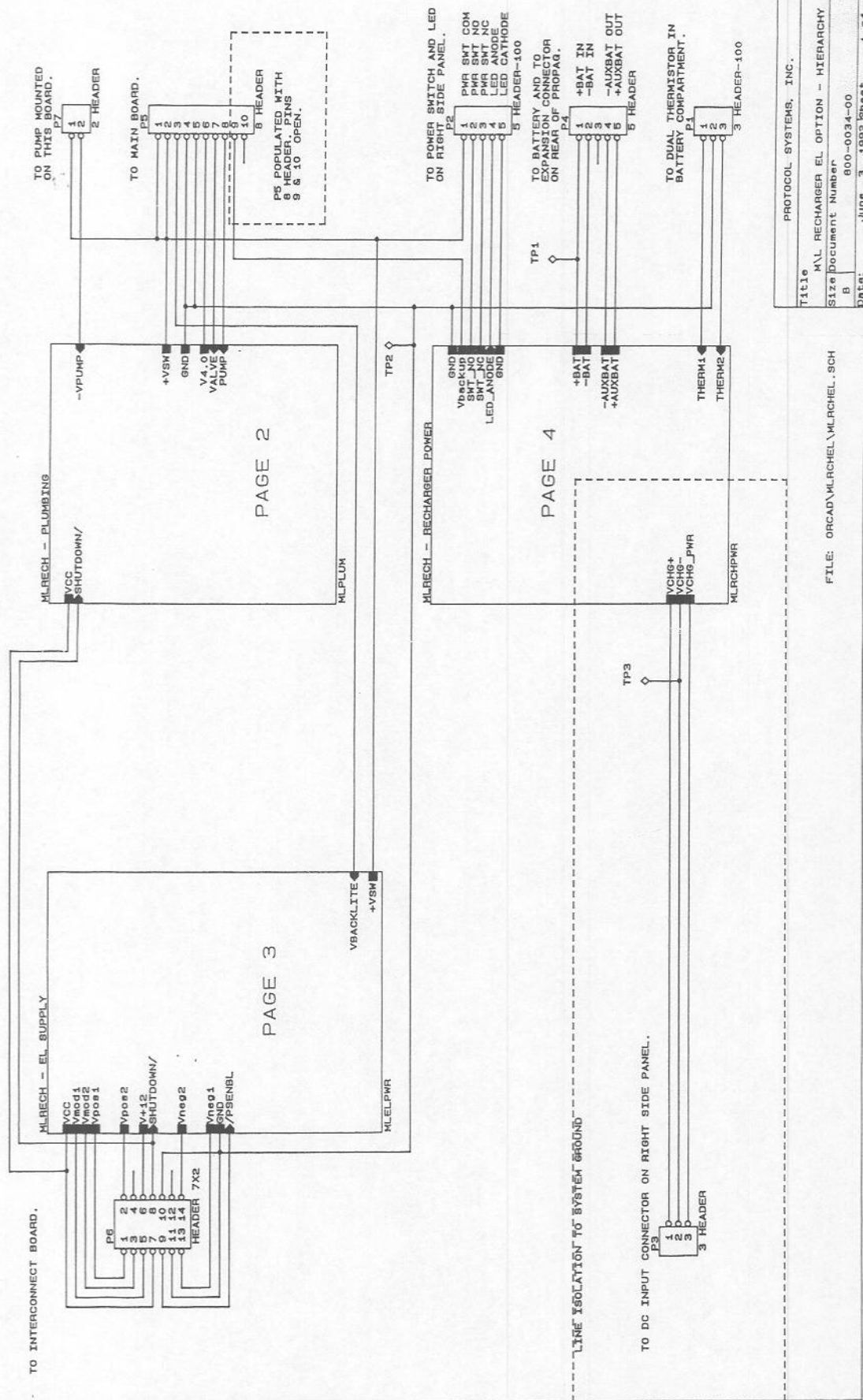


PROTOCOL SYSTEMS, INC.

Title
 M/L RECHARGER LCD OPTION - RECHARGER POWER
 Size Document Number
 B 800-0033-00
 REV A
 Date: June 3, 1992 Sheet 4 of 4

FILE: MLRCHPWR

--CU FEATURE_TEST_POINT--

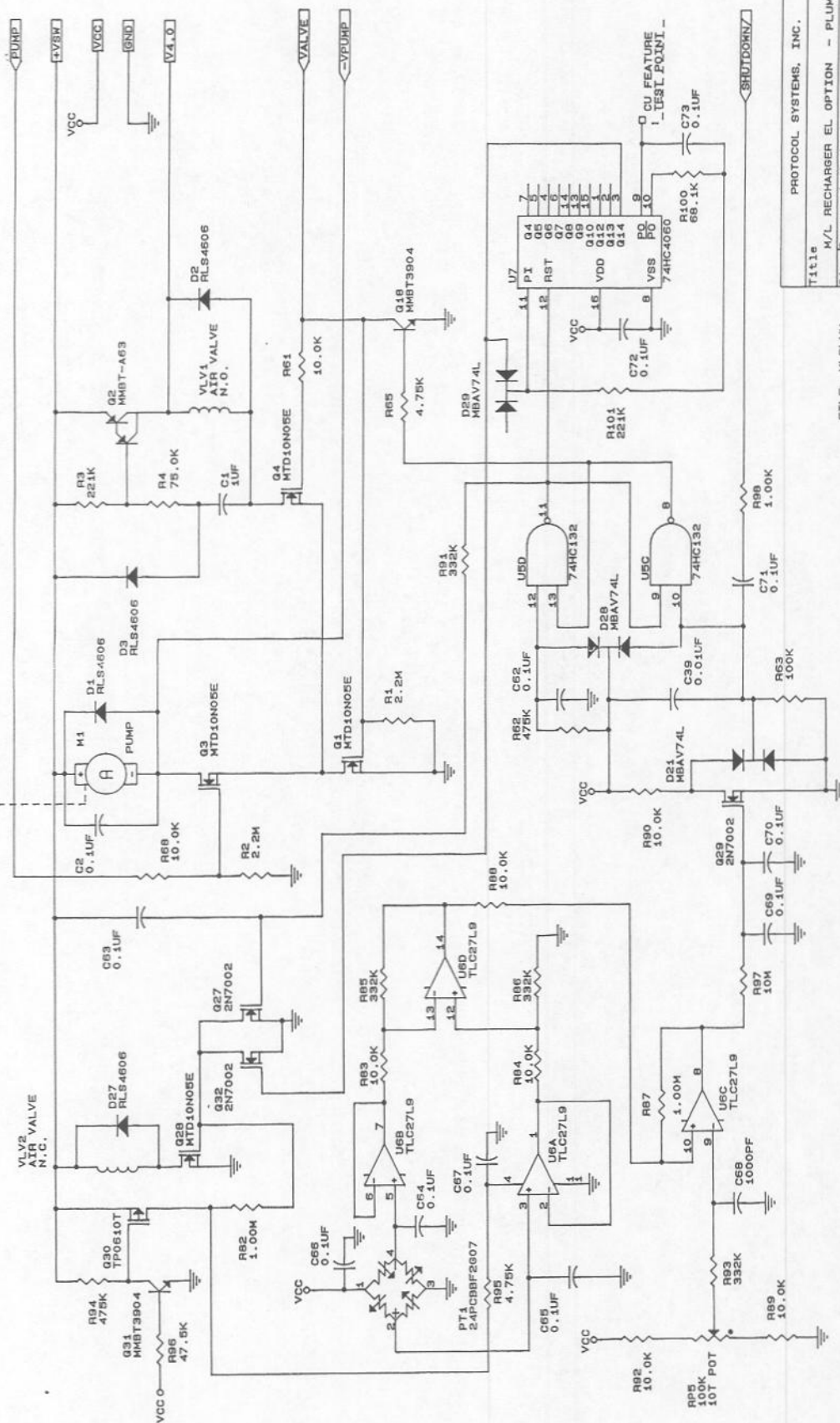


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Size	Document Number	800-0034-00	REV
B			A
Date:	June 3, 1992	Sheet	1 of 4

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PROTOCOL SYSTEMS, INC.

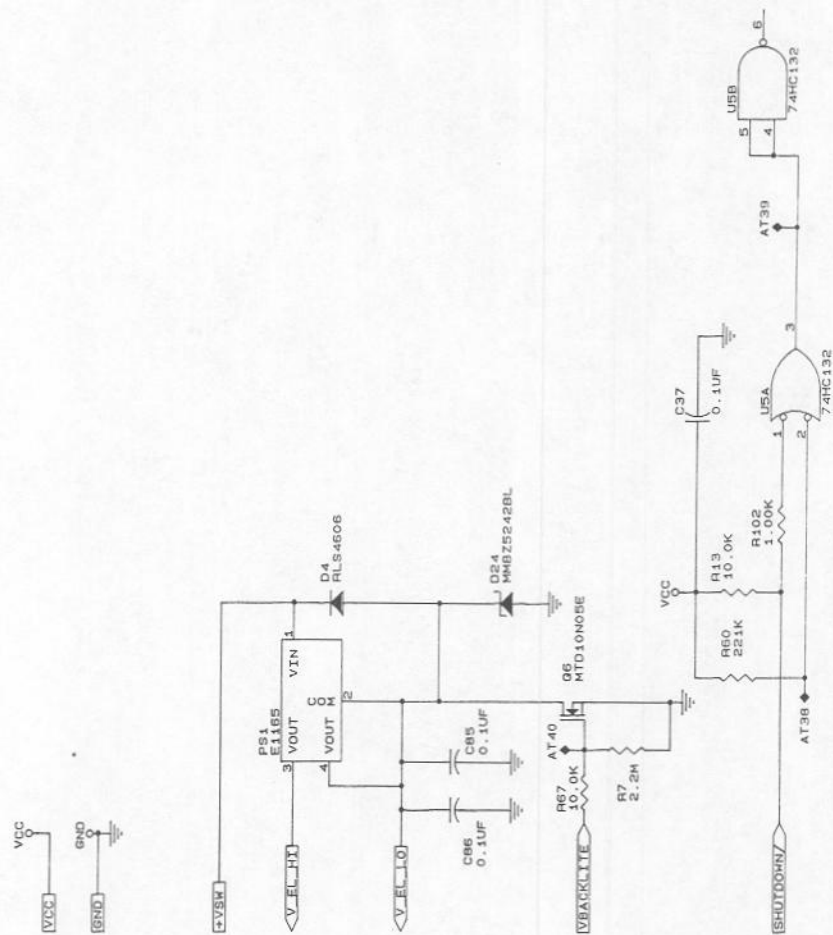
NOTE: M1 SHOWN FOR CLARITY. ELECTRICALLY CONNECTED THROUGH P7.



PROTOCOL SYSTEMS, INC.

FILE: M/LPLUM

Title
M/L RECHARGER EL OPTION - PLUMBING
Size Document Number
B 800-0034-00
REV
A
Date: June 3, 1992 Sheet 2 of 4

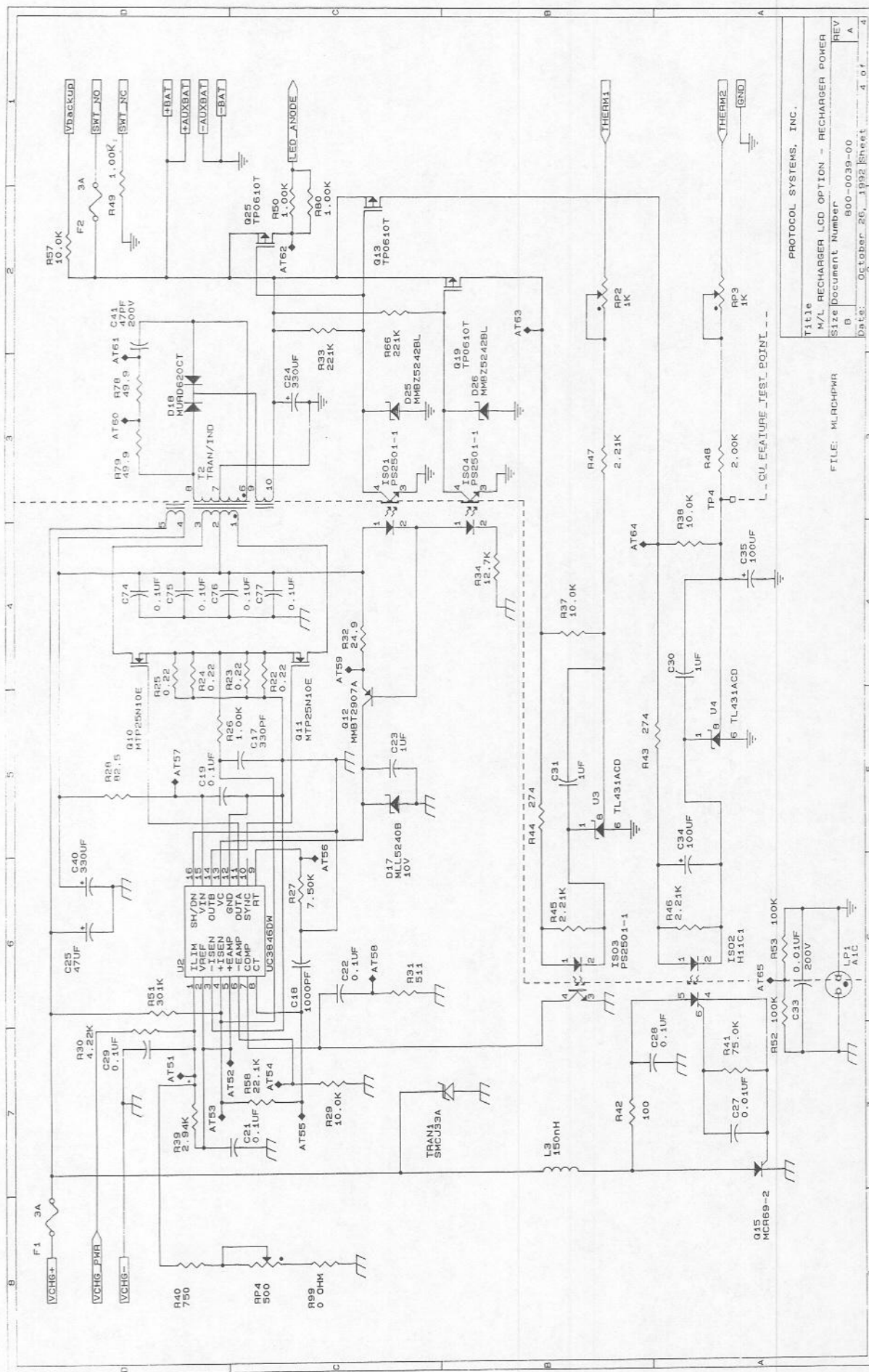


TO PIN 1 OF PG (PIN 8 OF 14 PIN FOOTPRINT).

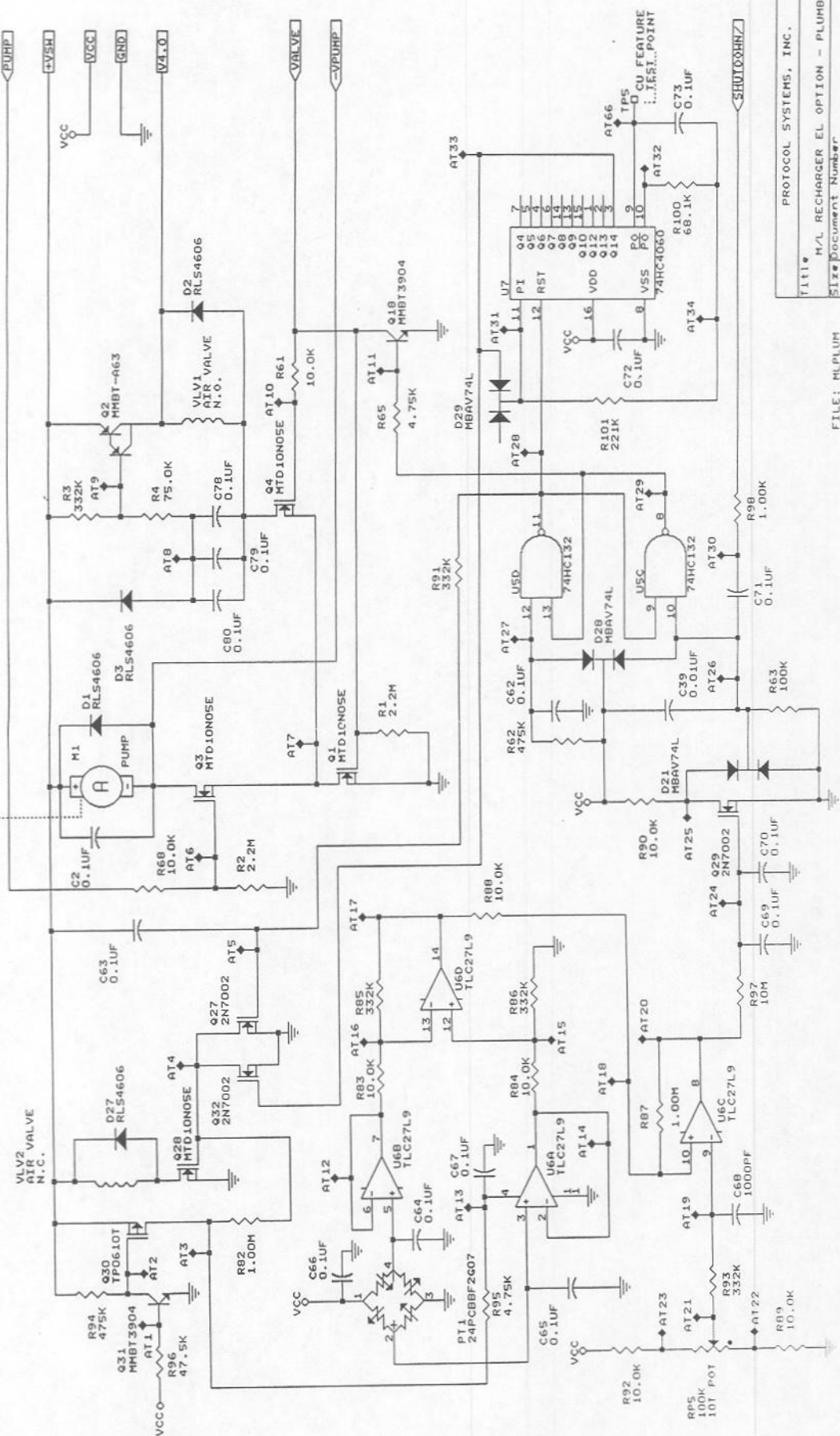
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Date			
October 26, 1992			
Sheet			
1 of 1			

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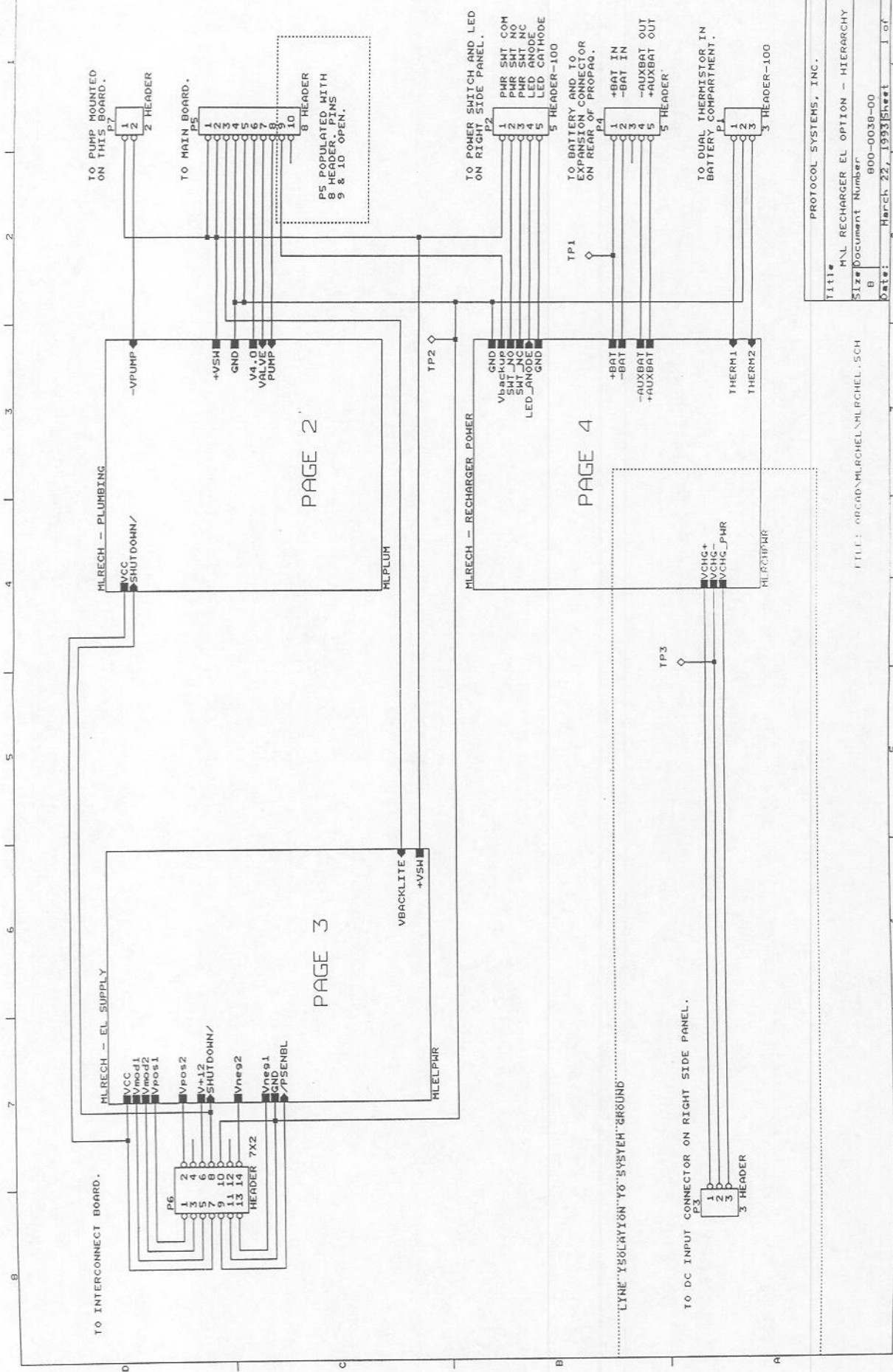
PROTOCOL SYSTEMS, INC.



NOTE: M1 SHOWN FOR CLARITY, ELECTRICALLY CONNECTED THROUGH P7.



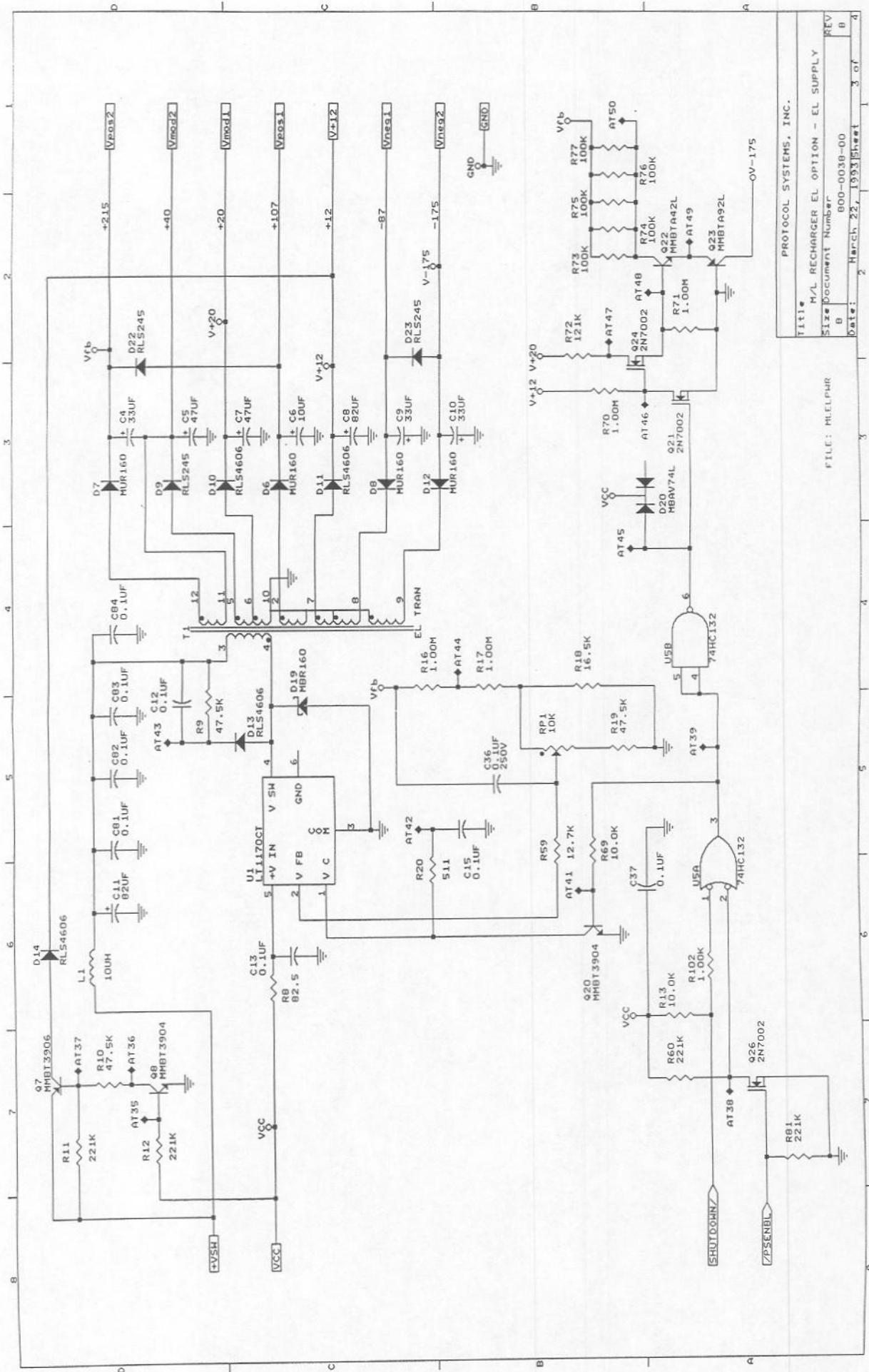
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Sheet 2 of 2	



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 Size: Document Number 800-0038-00
 Date: March 22, 1993 Sheet 1 of 4

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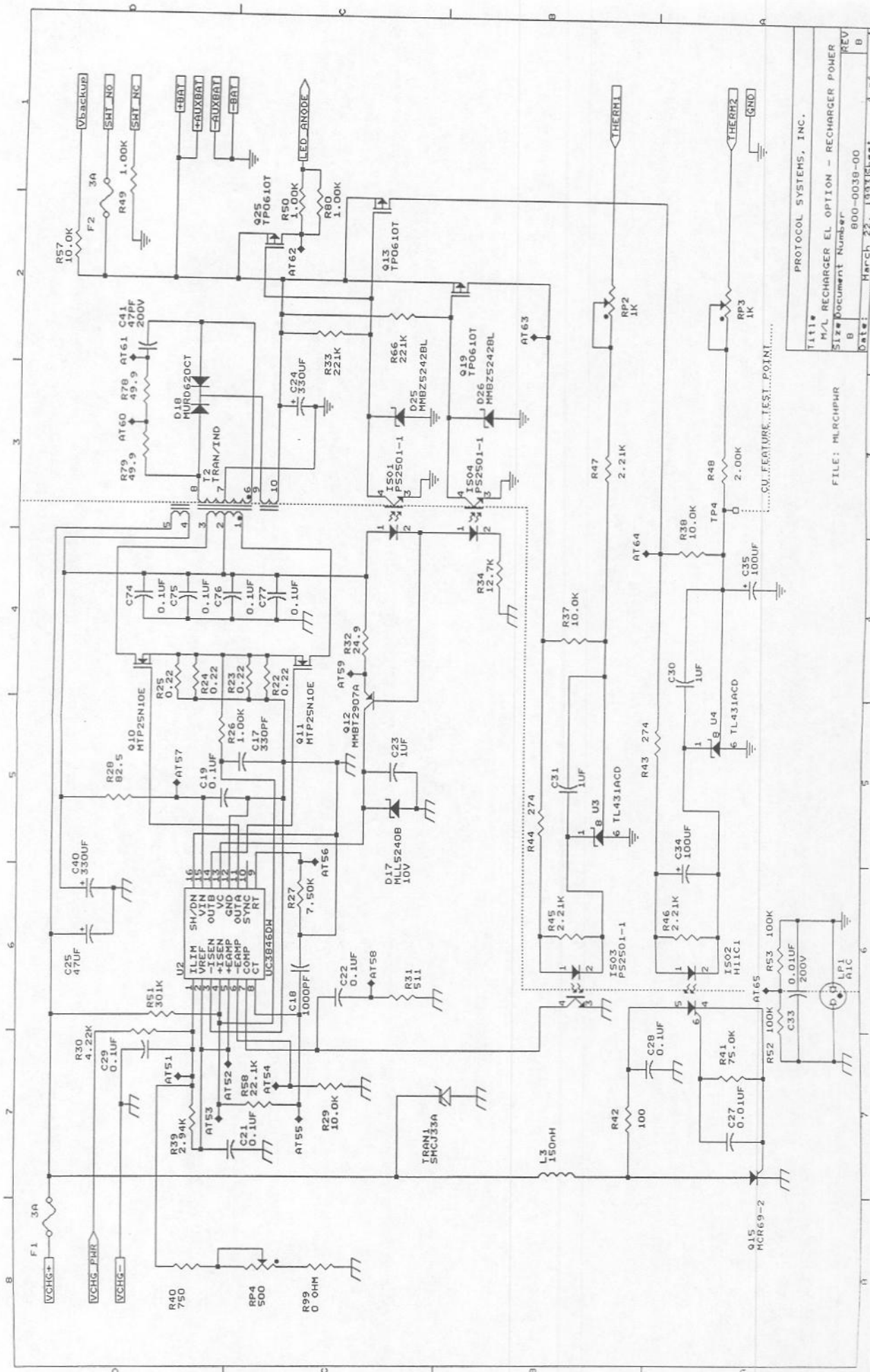
PROTOCOL SYSTEMS, INC.



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Date	March 22, 1993
Sheet	3 of 4

FILE: MLELPHR

PROTOCOL SYSTEMS, INC.



Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

FILE: MLCRPHR
 Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

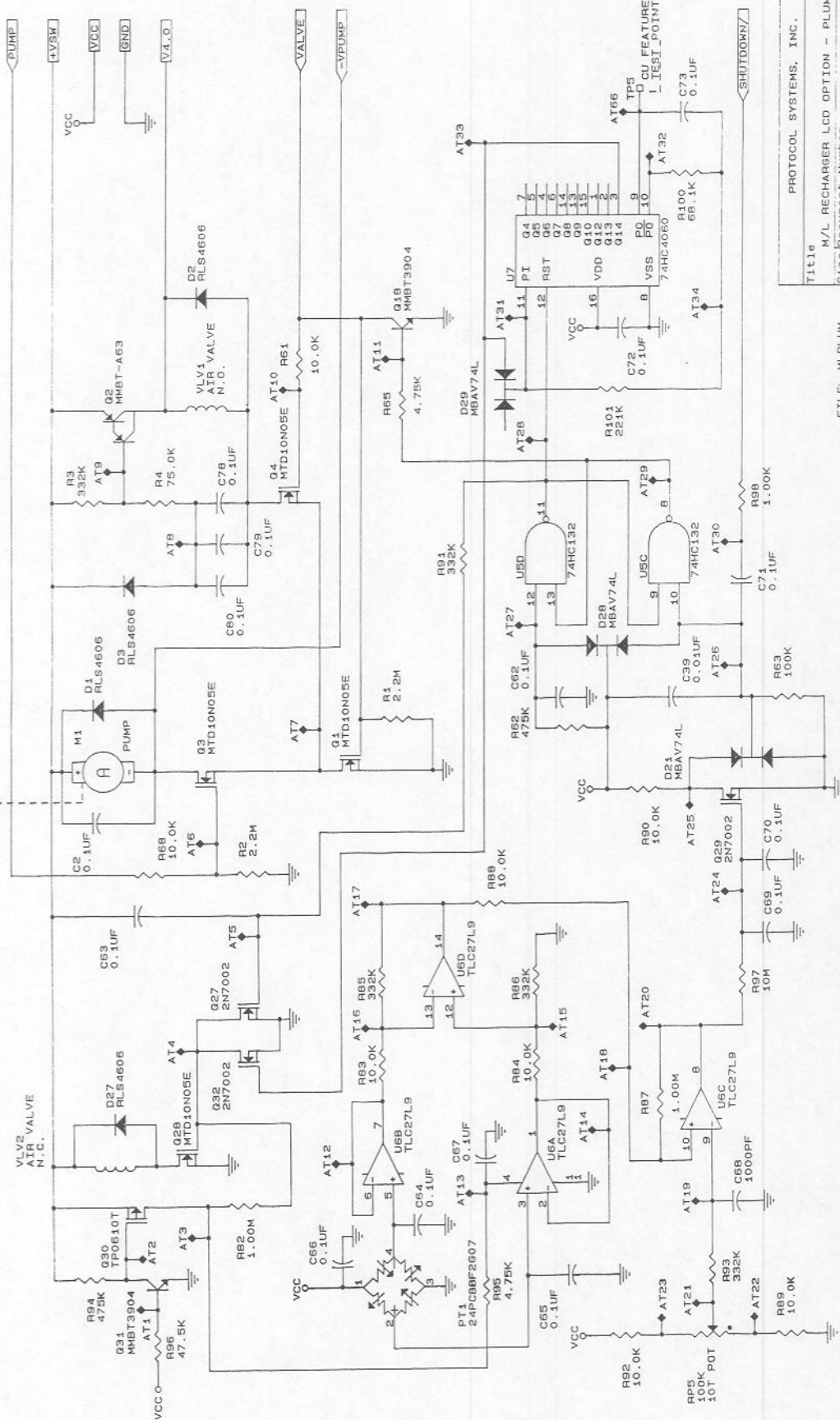
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Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

Title: M/L RECHARGER EL OPTION - RECHARGER POWER
 Size: Document Number 800-0038-00
 Date: 2 March 22, 1993 Sheet 1 of 4

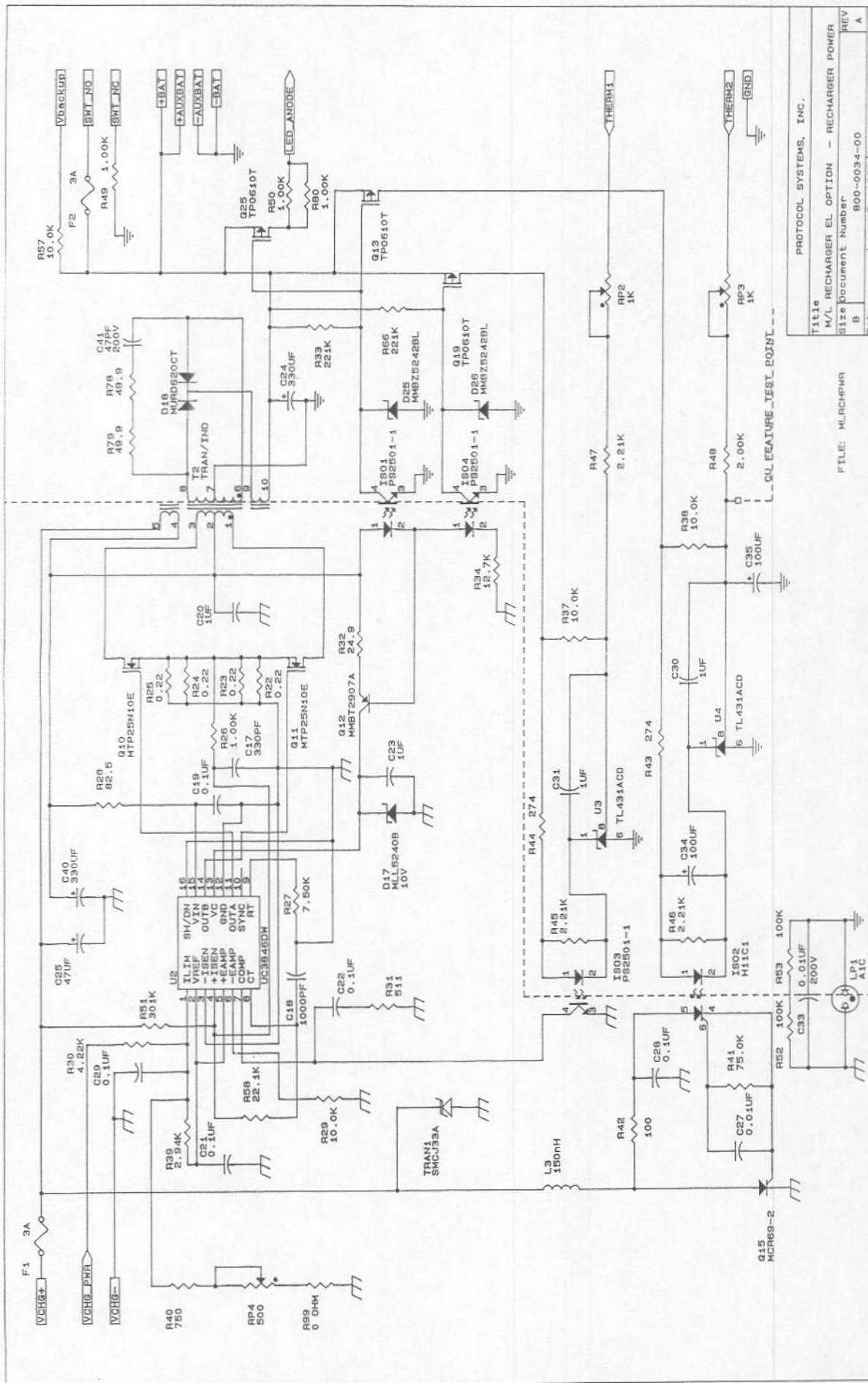
NOTE: M1 SHOWN FOR CLARITY. ELECTRICALLY CONNECTED THROUGH P7.



Title	M/L RECHARGER LCD OPTION - PLUMBING
Size	Document Number
REV	A
Date	October 25, 1992
Sheet	2 of 4

FILE: MLPLUM

PROTOCOL SYSTEMS, INC.



PROTOCOL SYSTEMS, INC.

Title
N/L RECHARGER EL OPTION - RECHARGER POWER
Size Document Number
REV
800-0034-00
A
Date: JUN 3, 1992 Sheet 4 of 4

FILE: MLCRPHR

CU FEATURE TEST POINT --

2D-Printer System

Detailed Circuit Descriptions

Refer to the listed schematics located in Section 2D, *Printer Section*.

Printer CPU Subsystem

Schematic 800-0024-00 Sheet 5, Section 2D

The CPU subsystem is designed around the 80C552 microprocessor with a multiplexed 16-bit address/8-bit data bus. The subsystem is comprised of the 80C552 microprocessor (U431), 64 k bytes of ROM (U550), and 64 k bytes of RAM (U540 and U440).

The 80C552 contains four 8-bit ports plus an 8-port analog-to-digital converter internal to the device. Port P0 provides the lower 8 bits of address and the data bus lines. Port P2 provides the upper 8 bits of address lines. U530, when activated, latches the lower 8 bits of address to the address lines A0 to A7. Port P1 provides several control lines (designated PT0 to PT7) used throughout the Printer. Pins P3.4 and P3.5 are additional control lines (PT8 and PT9). Except for P3.4 and P3.5, port 3 provides several processor control lines and the serial transmit/receive ports for communicating with the Propaq CPU. Except for two pins, Port 4 provides the printer motor control lines. Pins P4.4 and P4.5 provide control lines used in RAM bank switching and device selection.

Port 5 provides 8 analog input lines to the internal A-D converter. These lines are used to monitor the print head temperature, expansion module housing temperature, battery voltage, and +24 V supply.

The CPU controls the state of the Printer front panel LED using PT8 and U532C. The LED turns on when the printer is ready. It is off when the printer is not ready due to paper out, door open (head up), or other internal conditions.

The CPU enables the print heads through U332, U331, and U330 in the Printer Logic block. Only one print head segment is enabled at one time by selecting one of the Y1 to Y5 outputs of U332. The signal drives one of the lines HEAD0 to HEAD4 high and enables the selected print heads. The time to enable all five print head segments is 75.7 ms. Y6 of U332 (HEAD5) enables the latch in the print head. Y7 of U332 (HEAD 6) enables and disables the +24 V supply and removes power to other circuits. HEAD6 is kept low whenever the printer is not used.

Prior to enabling the print head segments, Y0 of U332 is selected to trigger or retrigger the one-shot, U230A. During the one-shot's time-out, its Q/ output is held low, allowing the enable signals to be written. Once U230A's time-out expires, all enable lines are disabled, serving as a safety time out to prevent head damage in the event of logic failure.

Printer Driver Subsystem

Schematic 800-0024-00 Sheets 4 and 6, Section 2D

The motor controllers (U410 and U510) drive the printer stepper motor. Each motor controller drives one winding of the printer motor.

Print data is sent to the print head one byte at a time through the parallel-to-serial converter, U541. The CPU loads the print data onto the address bus AD0 to AD7 and then selects U541 by resetting WR/ and bank switch to device. Once the data is loaded into U541, PSEN/ is clocked once for each bit to be shifted out of U541 and clocked into the print head's shift register.

U231C, U231B, and U231D provide serial communications control between the Propaq CPU, the Printer CPU, and future expansion processors. Q244 connected to the output of U231C prevents any communication between the Printer and Propaq once the Propaq's VCC power supply shuts down.

U531B detects when paper is out. Q411, controlled by PLED from the CPU provides current to an LED in the printer assembly. When paper is present, light from the LED reflects off the paper onto a photo-transistor receptor. This signal is amplified by U531B, which results in the paper-out signal to the CPU. R510 and R511 connect to the cathode of the photo-transistor's LED. R530 connects to the photo-transistor's emitter.

The enable periods of the print heads depend on the print head temperature. U333C is a gain stage for the head temperature sensor circuit. Signal lines THERM1 and THERM2 connect to a thermistor in the print head assembly. The thermistor is the feedback resistor for the stage and controls the output of U333C. The output of U333C is digitized by the CPU (ADC0) to determine the head temperature.

System Power Subsystem

Schematic 800-0024-00 Sheet 3, Section 2D

The Printer system power supply operates similar to the Propaq power supply. The Printer power supply is a high-efficiency switching power supply using an LT1071 regulator (U250). The regulator operates from battery power only upon startup. Once it is running at nominal operation, the power supply generates its own source (V3.5). The Printer power supply starts when the Propaq power supply is energized and the Propaq's Vcc supply (PRO_VCC) is at nominal. PRO_VCC then turns on Q140, which turns on Q240. By the time the Printer's power supply is operating, C140 has charged, turning off Q140 and Q240. The regulator (U250) then operates from the V3.5 supply.

As the regulator first starts, pin 1 of U250 is at ground potential. A soft start of the Printer supply is initiated as PRO_VCC slowly charges C250, which slowly turns off Q243, raising U250 pin 1 from ground.

The Printer supply is turned off when PRO_VCC drops as the Propaq shuts down. When PRO_VCC goes low, Q241 turns off, allowing the base of Q242 to rise, turning it on. This pulls U250 pin 1 to ground, turning off the regulator.

The output of the regulator V SW is connected to T350 and D350. When the switch in the regulator is on, pin 2 of T350 is pulled to ground and battery current flows through the primary (pins 1 and 2) of T350. The current flows through F2, and L250. L250 and C251 provide a filter to prevent the supply from putting noise back on the battery line. During this time all the outputs of T350 are driven in a direction to turn off their respective diodes. The outputs are sustained by the respective filter capacitances. During this time, energy is being stored in T350's magnetic core. The amount of energy depends on how long the switch in U250 stays on. When the switch turns off the primary, and all the secondaries "flyback" to voltages of an opposite polarity. In the case of the primary which has one side (pin 1) connected to the battery, the other side will become positive with respect to the battery. Parasitic effects can cause this voltage to reach extremely high values for very short periods. A "snubber" circuit, composed of D350, R350, and C252, prevents this voltage from reaching a level that would damage the switch in U250. While the switch is off, the various outputs are switched back in the direction to turn on their respective diodes. When this happens, current flows from the transformer secondaries to the outputs. The energy stored in the transformer core, when the switch is closed, is transferred to the outputs when the switch is open. The switch turns on at a fixed rate, nominally 40 kHz. One of the outputs, Vcc, is fed back through a divider, R340 and R341, to pin 2 (VFB) of U250. The fed back voltage is compared to an internal reference inside U250 and the "on time" or duty cycle is adjusted to provide regulation.

Except for the +24 V printer supply, all supplies are generated at the output of T350.

U430 is a precision 5 V reference, which generates the AVREF+ voltage source.

U333D is a gain stage for another temperature sensor circuit. The thermistor is placed over the printer assembly to monitor the temperature in the Expansion Module near the printer.

U333A is a unity gain voltage follower to apply the divided battery voltage from R440 and R383 to the A/D converter. This is to prevent loading of the voltage divider and changing the divide ratio.

Printer Power Subsystem

Schematic 800-0024-00 Sheet 2, Section 2D

The +24 V supply, a variation of the boost converter, provides current for the print heads and motor. U220, a pulse width modulator controller, provides the pulses that switch Q310 and Q110. T210 and its associated components provide cycle-by-cycle current limit to U220.

The +24 V supply is monitored and digitized by CPU using Q440 and its associated components.

Bill of Materials—Printer

Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
12	600-0070-00	SOLDER LUGS, #6
34	620-0024-00	NUT, HEX, 6-32, SS
38	620-0047-00	SCREW, 6-32X.25, PH, PH, NYLOC, SS
41	620-0074-00	SCREW, 8-32, 1.5" PH, NYLON, SLOTTED
41	620-0074-00	SCREW, 8-32, 1.5" PH, NYLON, SLOTTED
42	620-0075-00	NUT, 8-32, NYLON
42	620-0075-00	NUT, 8-32, NYLON
	640-0264-00	LABEL, BAR CODE, PCB'S
	800-0024-00	SCHEMATIC, PRINTER MAIN PCB, MULTILANGUAGE
	821-0075-00	TEST PROC M/L PRINTER BOARD FUNCTIONAL
	030-0023-00	PCB, PRINTER MAIN, MULTILANGUAGE
	824-0203-00	ASSY DWG, PRINTER MAIN PCB, MULTI LANGUAGE
	824-0208-00	ASSEMBLY DRAWING, EXPANSION MODULE
C1	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C2	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C4	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C5	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C100	250-0009-00	CAP, 2700 UF, +/-20%, 10V
C110	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C120	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C130	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C140	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C220	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C221	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C222	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C223	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C224	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C230	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C231	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C240	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C241	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C242	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C243	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C244	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C250	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C251	250-0011-00	CAP, 1000UF, +/-20%, 10V
C252	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C253	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C300	250-0008-00	CAP, 10K UF, 20%, 25V ELECTROLYTIC
C310	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R

Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
C311	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C320	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C330	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C331	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C333	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C340	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C342	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C421	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C422	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C430	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C432	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C433	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C434	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C435	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C436	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C437	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C438	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C440	250-0031-00	CAP,27UF,35V,+/- 20% ALUMINUM ELECTROLYTIC
C441	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C442	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C450	250-0024-00	CAP,330UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C510	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C511	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C520	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C521	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C522	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C523	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C530	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C531	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C533	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C534	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C540	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C541	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C542	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C543	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C550	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D110	307-0010-07	DIODE,SUPER FAST,1.0 AMP
D210	307-0002-08	SCHOTTKY RECTIFIER, SURFACE MOUNT, MBRL140
D211	307-0002-08	SCHOTTKY RECTIFIER, SURFACE MOUNT, MBRL140
D212	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D213	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG

Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
D250	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D310	307-0009-07	DIODE, 2AMP, SUPER FAST
D311	307-0009-07	DIODE, 2AMP, SUPER FAST
D320	307-0010-07	DIODE, SUPER FAST, 1.0 AMP
D340	306-0001-10	DIODE ARRAY, GENERAL PURPOSE, M5499, SOT-23 PACKAGE
D342	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D343	306-0004-08	DIODE, SWITCHING, HIGH VOLTAGE
D350	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D450	307-0002-08	SCHOTTKY RECTIFIER, SURFACE MOUNT, MBRL140
F1	503-0019-00	FUSE, 15 AMP, 32V
F2	503-0008-00	FUSE, PICO, 3A, 125V
FB1	352-0003-00	CORE, MAGN., 30"L, 30"OD, .09"ID, 1 HOLE
FB2	352-0003-00	CORE, MAGN., 30"L, 30"OD, .09"ID, 1 HOLE
L110	350-0002-00	INDUCTOR, 10 UH, HIGH CURRENT FILTER
L200	350-0007-00	INDUCTOR, SWITCHING, CUSTOM
L250	350-0005-00	INDUCTOR, 15 UH
L310	350-0004-00	INDUCTOR, 3.3 UH
L340	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L450	350-0005-00	INDUCTOR, 15 UH
P1	610-0049-00	HEADER, 2PIN, .100 CTR
P2	610-0055-00	HEADER, 5-PIN
P140	610-0055-00	HEADER, 5-PIN
P150	610-0056-00	CONTACT, POSTED, 30 AMP
P150	610-0059-00	HOUSING, BLACK, 30 AMP
P150	610-0060-00	HOUSING, RED, 30 AMP
P330	008-0038-00	ASSY, PRINTER HEAD CABLE
P400	610-0055-00	HEADER, 5-PIN
P402	610-0049-00	HEADER, 2PIN, .100 CTR
P501	610-0048-00	HEADER, 3-PIN, .100 CTR
P502	610-0047-00	HEADER, 6-PIN, .100 CTR
Q1	302-0006-00	XSTR, POWER MOS, N-CHANNEL, MTD10N05E, D-PAK
Q2	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q3	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q4	301-0010-10	XSTR, TP0610T, P-CHANNEL, MOSFET
Q110	300-FZ40-04	XSTR, HEX FET, N-CHANNEL, 50V
Q140	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q240	301-0003-10	TRANSISTOR, PNP DARLINGTON, MMBTA63, SOT23 PK
Q241	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q242	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q243	301-0002-10	TRANSISTOR, PNP SMALL SIGNAL, MMBT3906, SOT23 PACKAGE
Q244	301-0001-10	TRANSISTOR, NPN, SMALL SIGNAL, MMBT3904, SOT23
Q310	300-FZ40-04	XSTR, HEX FET, N-CHANNEL, 50V

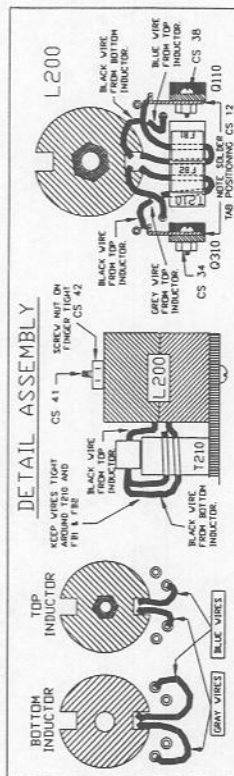
Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
Q340	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q411	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE
Q440	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R2	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R3	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R4	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R5	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R6	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R7	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R8	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R120	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R121	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R130	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R140	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R141	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R142	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R143	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R144	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R145	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R146	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R147	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R220	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R221	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R222	201-2001-00	RESISTOR, SMT, 1206 PKG, 2.0K, 1%
R223	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R224	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R225	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R226	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R230	201-6341-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 6.34K 1%
R231	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R232	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R233	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R240	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R241	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R242	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R243	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R330	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R331	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R332	201-3922-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 39.2K, 1%
R333	202-0001-00	RESISTOR,100K OHM,0.1%
R334	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%

Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
R335	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R336	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R337	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R340	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R341	201-3321-00	RESISTOR,3.32K OHM,1%,SMD
R350	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R410	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R411	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R412	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R413	203-0002-00	RESISTOR,2.2 OHMS,5%,SMD
R420	200-0004-00	THERMISTOR,SMD,10K OHMS,+/-10%
R422	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R423	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R431	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R432	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R440	202-0001-00	RESISTOR,100K OHM,0.1%
R441	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R510	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R511	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R512	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R515	201-5622-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 56.2K 1%
R516	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R517	203-0002-00	RESISTOR,2.2 OHMS,5%,SMD
R520	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R530	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R540	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R541	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
S550	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
SP110	503-0049-00	COIL SPACER
T210	350-0006-00	INDUCTOR,CURRENT SENSE
T350	360-0003-00	XFMR,8083,CUSTOM MULTI-VOLTAGE OUTPUT

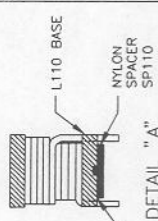
Reference Designator	Part Number	Description
CS Drawing Designator (Dwg. #824-0203-00), Printer Board 031-0025-00		
U130	400-0393-03	IC, SMT, 74HC393, DUAL 4-BIT BINARY COUNTER, SOIC
U220	475-0003-00	CURRENT MODE PWM CONTROLLER,SMD
U230	400-0123-03	IC, SMT, 74HC123A, DUAL TRIGGERABLE MONOSTABLE MULTIVIB, SOIC16
U231	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U250	474-0003-04	SWITCHING REGULATOR,LT1071CT,2.5A
U330	400-0002-03	IC,QUAD 2-INPUT POSITIVE NOR GATE,74HC02
U331	400-0002-03	IC,QUAD 2-INPUT POSITIVE NOR GATE,74HC02
U332	400-0138-03	IC,SMT,74HC138,3 TO 8 LINE DECODER,SOIC16
U333	470-0003-03	TLC27M4ACD,QUAD CMOS OP-AMP,MEDIUM POWER
U410	475-0002-00	STEPPER MOTOR DRIVE CIRCUIT,PBL3717/2
U430	473-0001-00	IC,PRECISION REFERENCE,5V
U431	440-8055-00	IC,MICROCONTROLLER,8-BIT
U440	430-0004-00	IC,20256LM10,32KX8 SRAM
U510	475-0002-00	STEPPER MOTOR DRIVE CIRCUIT,PBL3717/2
U530	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U531	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U532	400-0000-03	IC, SMT, 74HC00, QUAD 2-INPUT POSITIVE NAND GATE, S014 PKG
U540	430-0004-00	IC,20256LM10,32KX8 SRAM
U541	400-0165-03	IC,74HC165,8BIT SERIAL OUTPUT SHIFT REGISTER
X530	502-0005-00	CRYSTAL,SMD,10.752,MHZ

4-PROTOCOL®		SYSTEMS, INC.	
NAME	DATE	COATING TITLE	COATING NO.
L. VAUGHN	7/17/92	ASSEMBLY, MULT. LANG.	REV
J.SANELLE	7/17/92	PRINTER MAIN PCB	C
J.SANELLE	7/17/92		SCALE
J.SANDBERG	7/17/92		1/2" = 1"
G. KERSLEY	7/17/92		1/2" = 1"

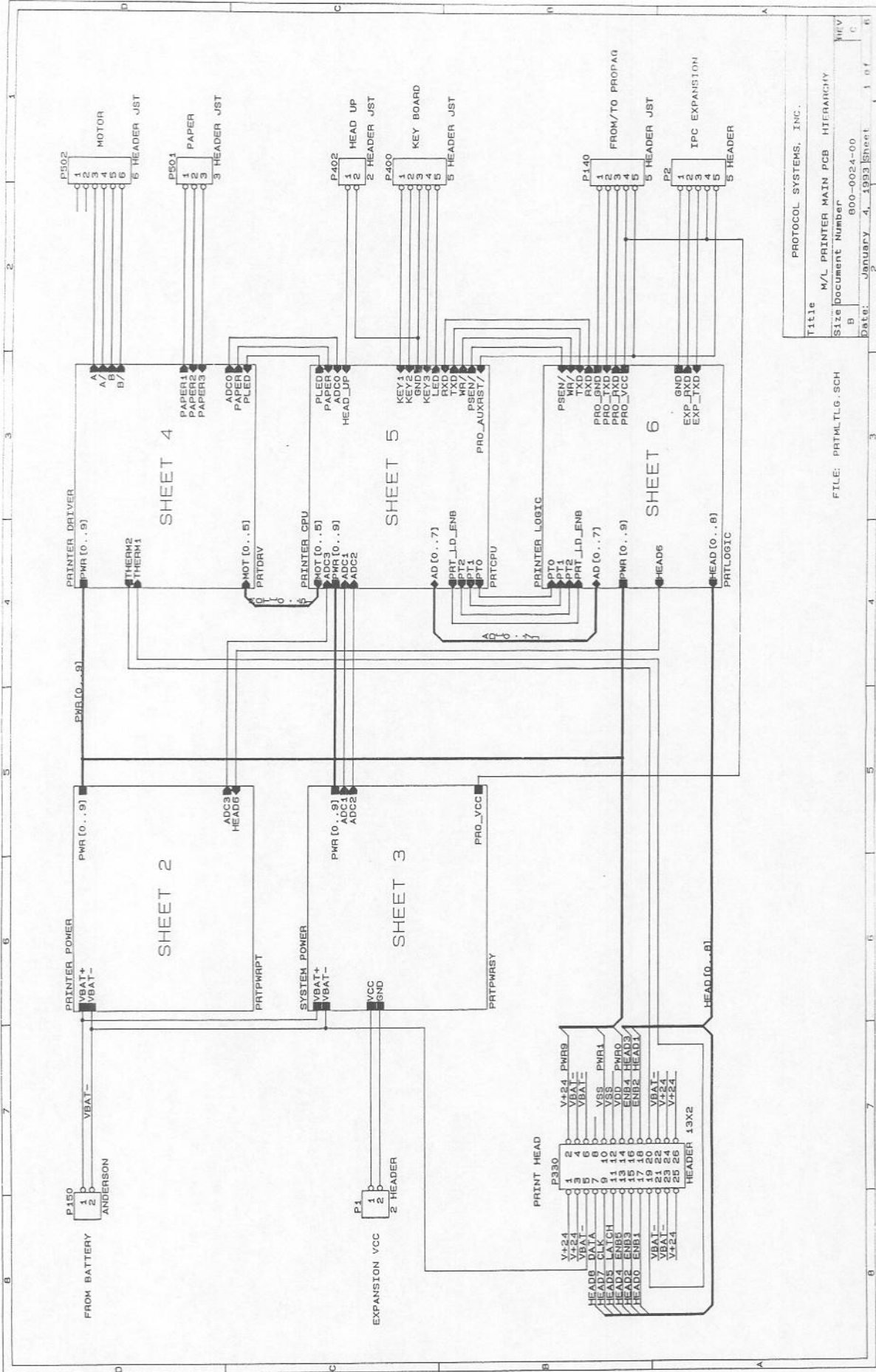
ASSEMBLY PART NUMBER SUFFIX IS OBTAINED FROM THE BILL OF MATERIAL AND MARKED IN PERMANENT CONTRASTING INK WHERE SHOWN.



NOTE: SHOULDER OF NYLON SPACER TO FIT INTO BACK OF L110. SPACER TO BE FLUSH WITH BOTTOM OF L110 PRIOR TO L110 INSTALLATION.

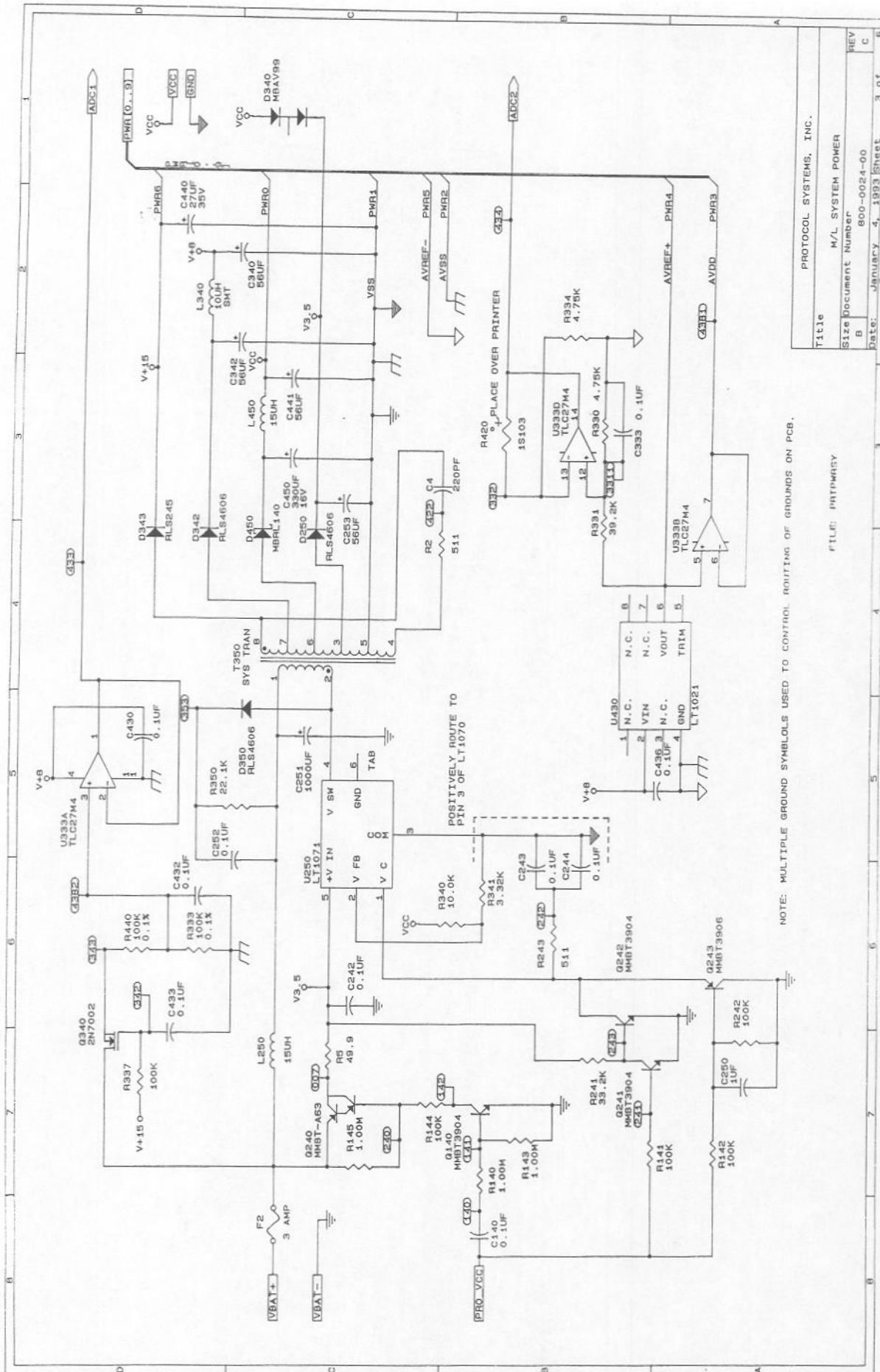


DETAIL "D"



Title: M/L PRINTER MAIN PCB HIERARCHY
 Size: Document Number B 900-0024-00
 Date: January 4, 1993 Sheet 1 of 1

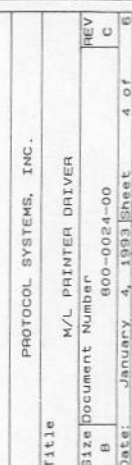
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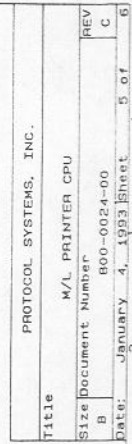


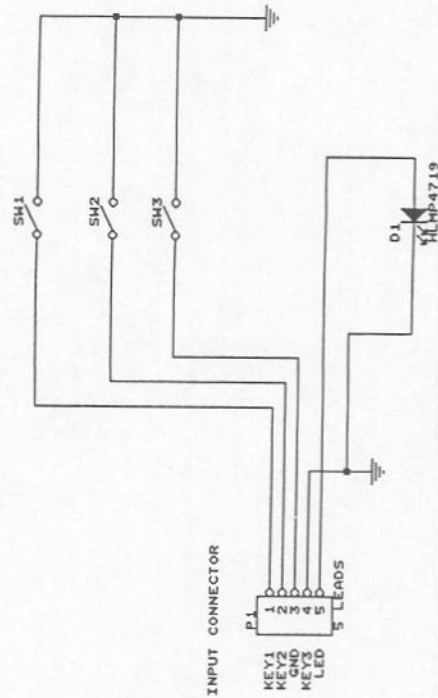
NOTE: MULTIPLE GROUND SYMBOLS USED TO CONTROL ROUTING OF GROUNDS ON PCB.

FILE: PTHMWSY

Title	PROTOCOL SYSTEMS, INC.
Size	M/L SYSTEM POWER
Document Number	800-0024-00
REV	B
Date	January 4, 1993
Sheet	3 of 5







PROTOCOL SYSTEMS INC
 Size Document Number
 B 800-0006-00
 Date: October 15, 1992 Sheet 1 of 1

FILE: PAKKEY.00B

2E—Oximeter (SpO₂)

Detailed Circuit Descriptions

This section provides detailed descriptions of the SpO₂ circuitry. Component designators found on the schematics located in Section 2E, *Oximeter*, are used in this description to identify components. Grid locations of the components on the schematics are indicated in parentheses, for example (B4).

SpO₂ Board *Schematic 00950; 7 sheets, Section 2E*

Input Selector/Amplifier

Schematic 00950; 2 of 7, Section 2E

Since there are two different input connectors providing unamplified (D-connector) or amplified (LEMO connector) signals, the CPU determines by the presence of a calibration resistor, which connector is being used, and selects the appropriate input. If the D-connector is being used, an internal amplifier must be switched into the signal path.

NOTE

Earlier versions of the Propaq Pulse Oximetry Option included the LEMO connector.

The CPU determines which connector is used by detecting the presence of the calibration resistor located inside the transducer through either the LEMO connector or D-connector. Once the determination has been made (LEMO or D connector), the CPU "sets up" the signal path accordingly. If the transducer is connected to the D-type connector, the calibration resistor is sensed through VCALIN2 (H5), U21B (C5), and VCAL2 (A5); if a NELLCOR patient cable is connected to the LEMO connector, the calibration resistor is sensed through VCALIN1 (H5), U21A (D5), and VCAL1 (A5). Sensing through either connector is performed identically. The following description is for sensing VCALIN1.

VCALIN1 is connected to one end of the calibration resistor in the transducer. The other end of the resistor is connected to ground. The calibration resistor ranges in value from 6 kΩ to 10 kΩ. The resistor, in conjunction with R17 (E4), forms a voltage divider. The top of the voltage divider is supplied by a +2.5 V reference, REF2.5 (A4). With a transducer connected, the sensed voltage is in the range of +1.1 to +1.4 V. Without a transducer, the input of U21A is pulled to +2.5 V. The sensed voltage is buffered by U21A. The output of U21A connects to one of the SpO₂ ADC inputs (U20 on sheet 5 of 7, grid location G4) via switch U24 (sheet 5 of 7, grid locations C1 and C3) of the CPU. (Do not confuse the CPU's internal ADC with the SpO₂ ADC, U20 (F3), on sheet 5 of the schematics). Once the CPU determines which connector is being used, it sets the switch in U10A to select the output of the appropriate pre-amp.

There are two separate signal paths depending on which connector is used. If the D-connector is used, the signal from the photo diode in the transducer must first be converted from current to a voltage by U8 (F2) before it is passed to XX (output signal) through switch U10A (C1). If the LEMO connector is used, the converter in the patient cable has already made the I-V conversion, and the signal is routed directly through U10A to XX.

U10A is an electronic, 2-pole switch. When pin 15 of U10A is 0 V (D-connector selected), D2 is connected to S2, and D1/S1 is open. When pin 15 is 5 V (LEMO connector selected), D2/S2 is open and D1/S1 is closed. The LEMO control line (A2) from the CPU switches U10A to select the appropriate input. If the D-connector is selected, the LEMO control line activates U8 by closing switches U4C (C2) and U4D (C4). The +15 and -15 supply lines supply power to U8, allowing the converter to operate. The non-inverting input of U8 rests at about +8 V due to a voltage divider network using R44 (F3) and R38 (F4).

AC-coupled Amplifier, Variable Gain Inverting Amplifier, Synchronous Detector, and Splitter

Schematic 00950; 3 of 7, Section 2E

Fig. 7F-1 shows a typical waveform of signal XX. This signal is always less than 8 V (it may be negative), and its low points correspond to either the red or yellow LED being on. Signal XX is ac-coupled through R59 (D1), C55 (D1), and U13B (E1). U13B is an inverting amplifier with a gain of -1. The signal now contains positive and negative signal excursions. The composite signal is then selectively attenuated from 1/256 to 255/256 times to obtain the best signal level for further processing (shown as T8 in Fig. 7F-1). The CPU controls the attenuation level through a multiplying DAC, U9 (E2), and amplifier U13A (G2). The output from the attenuator is then amplified again by U14B (B4), an inverting amplifier with a gain of 51. The combination of the processor controlled attenuator and U14B provides amplification factors from 0.20 to 51 in 1/256th step increments.

The CPU can continually monitor the input signal before and after amplification through two peak detector circuits, U7A (C2) and U7B (A4). These circuits operate identically with the exception that U7A is an inverting amplifier and U7B is non-inverting. This is due to the input signal inversions taking place through the signal path. By the time the input signal (XX) reaches U7A, it has been inverted once (negative going). The signal contains negative excursions with a maximum possible level of -15 V (although the signal should never reach this voltage). Only the U7A circuit is described here.

When the circuit first begins to acquire the transducer signal, C34 (B2) is at ground potential. As the negative excursions drop approximately 0.6 V below the charge on C34, D2 (B1) conducts, charging C34 through R37 (B2). The time constant of this RC network is 47 μ s. As the signal rises, D2 stops conducting. C34 retains its charge for a period due to the relatively long time constant (23.5 ms) of C34 and R39 (C2). As the signal again drops to the conduction point of D2, C34 charges more and then retains the charge when D2 stops conducting. The charge on C34 builds and is maintained as long as the signal excursions continue to cause D2 to conduct. In this manner, C34 provides a peak voltage level representing the

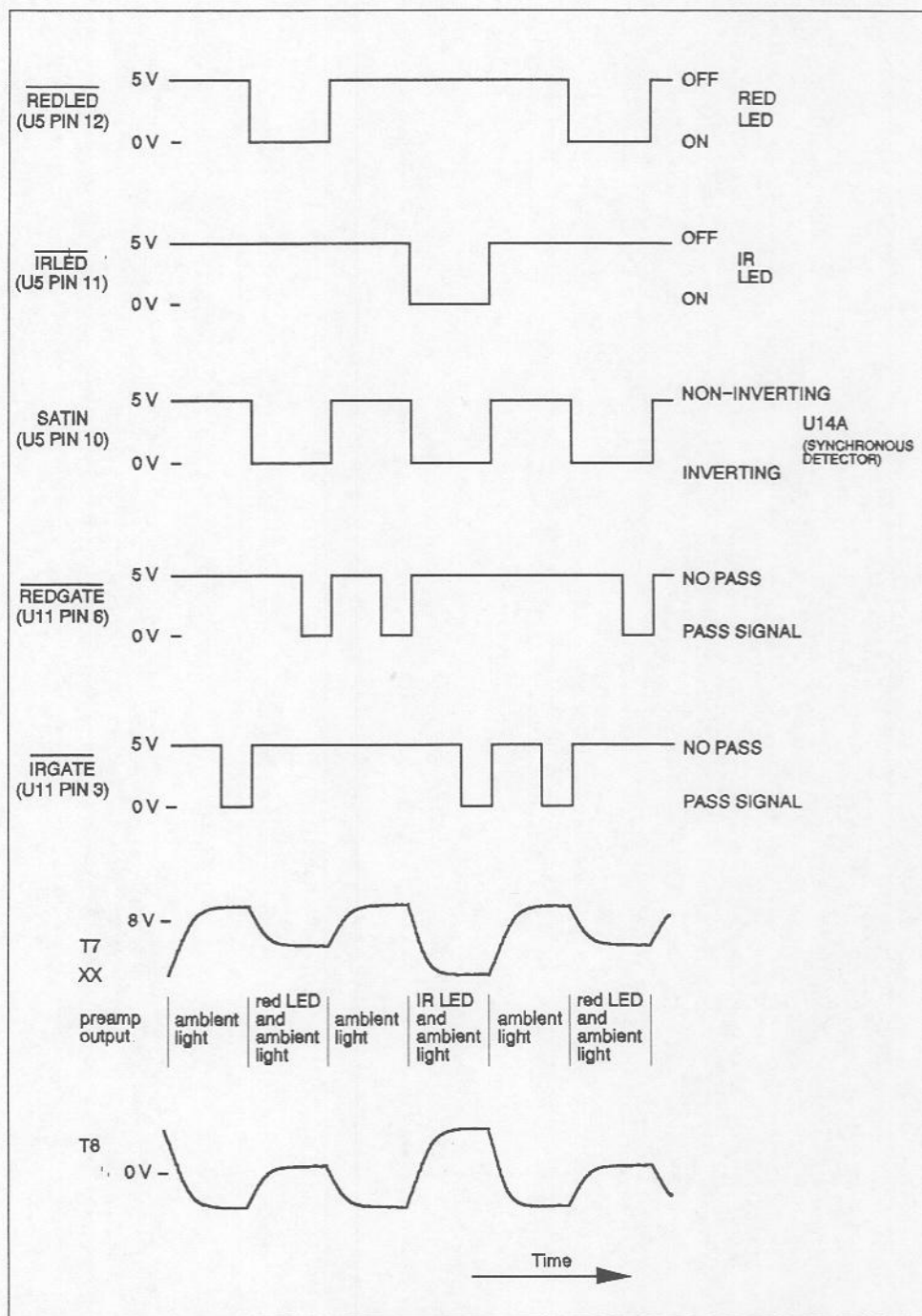


Fig. 2E-1. MiniSOOM Timing (Normal Run Mode)

maximum excursions of the input signal. The CPU periodically monitors the output of U7A, checking the voltage level. If the CPU detects voltage levels approaching clipping voltage, the CPU can reduce the LED drive current (see the description of the LED drivers later in this description).

Since the CPU controls when the LEDs are turned on and off, it knows the precise time at which the input signal levels represent the three types of light. It is at these switch points that the input signal is switched between

the inverting and non-inverting inputs of U14A. The synchronous detector inverts the output of U14B (T7 in Fig. 7F-1) when the signal represents both red and ambient detected light (or both IR and ambient detected light). See the SATIN signal in Fig. 7F-1. For the red light channel, the signal REDGATE is low for the last 3/8 of the time that the red-and-ambient light signal is present, passing that signal into the red channel filter (see schematic sheet 4). In the following period, REDGATE is low for the last 3/8 of the time when only the ambient light signal is present, allowing that signal to pass into the red channel filter also. By passing an inverted red-and-ambient signal and later a non-inverted ambient-only signal into the red filter channel, the ambient signal is subtracted from itself and only the red signal appears at the output of the red filter channel. The IR filter channel rectifies in the same way with IR and ambient signals.

After the signal has been amplified, checked for safe operating levels, and rectified, the signal components representing red and infrared light levels are split from each other. As with rectification, the timing required to split the signals is controlled by the CPU. U15A (F4) and U15B (F3) are opened and closed at precise times, allowing only red or IR signals to pass through. The control line REDGATE/ (A5) controls U15B; the control line IRGATE/ (A5) controls U15A.

Filter Networks

Schematic 00950; 4 of 7, Section 2E

After the signals are split into their respective red and IR components, the high-frequency components of the pulse waveform are removed through the filter networks. Both of the two 5-pole active filter channels have a -3 dB point of approximately 8 Hz. The red filter network gain is approximately 9.1. The IR filter network gain is X4.6. Both signals are slightly elevated above ground through voltage divider network, R12 and R68 (B5) and REF2.5 (+2.5 V). The output signals from these filters are slowly changing levels following the blood pulses through the sensor site. The IR waveform data is used to create the SpO₂ plethysmograph.

ADC

Schematic 00950; 5 of 7, Section 2E

U20 (F3) is a 16-bit ADC. The device is clocked by an 800 kHz crystal (pins 3 and 4) and can select one of two inputs (pins 19 and 24). Input selection is controlled by the CPU (pin 13). The voltage reference is +2.5 V (pin 20) from the REF2.5 reference line. The converted data is clocked to the CPU (SDATA pin 15) by a signal controlled by the CPU (SCLK pin 14).

There are four inputs signals that are periodically digitized: VCAL1, VCAL2, RED_ADC, and IR_ADC. VCAL1 and VCAL2 are digitized about eight times per second. RED_ADC and IR_ADC are digitized about 57 times per second. To set up the inputs for digitizing, the CPU selects the desired ADC input channel using ADCCHN (H4), which is connected to pin 13 of the ADC, and selects either the resistors or the transducer light signals for digitization using the RESISTORS control line (A3) connected to electronic switches U24A, U24B, U24C, and U24D. (Since only one of the resistors is present, only one will be digitized.) Once the appropriate switches are closed and the channel is selected, the CPU signals the ADC to start by setting pin 12 (ADCSTART/) high.

U19 (B3) is the +2.5 V reference (REF2.5). U18 (C5) is the -5 V supply (-VA).

LED Drivers

Schematic 00950; 6 of 7, Section 2E

The LED drivers provide up to 50 mA to the LEDs. The CPU controls how much current is provided by dynamically adjusting the reference voltage to the driver amplifier, U3A (E2). U1 (C4) provides the reference voltage, which is selectively switched for the IR and red LEDs using U4A (E4) and U4B (E5). The CPU adjusts the reference voltage for red or IR by changing the data to U1 (a multiplying DAC) before the voltage is switched to the amplifier. The CPU attempts to maintain the best possible drive current without clipping the signal from the transducer.

The control signals REDLED/ and IRLED/ (A2) control the switches U4A and U4B and the transistor network that drives the LEDs. The LEDs are never on at the same time, however, they are both off to detect ambient light.

When REDLED/ is low (IRLED/ is high), U4A is closed, placing the red reference voltage at pin 3 of U3A. Because REDLED/ is low, Q5 (F3) is off allowing Q3 (F3) to turn on and conduct current from the LED through R1 (G3), the sense resistor. With REDLED/ low, Q2 (G1) turns on allowing current to flow from the positive supply to the red LED anode. Because IRLED/ is high, Q1 (F2) is off (no current conduction) and Q6 (G3) is on, which pulls the base of Q4 (G2) to ground, ensuring it remains off. The current path is from VCC, through Q2, the red LED, through Q3 and the sense resistor R1.

The voltage across the sense resistor is fed back to U3A, which compares it to the reference voltage and adjusts the drive on Q3 accordingly.

When REDLED/ goes high and IRLED/ goes low, the reference voltage is applied through U4B to U3A. With REDLED/ high, Q2 is off and Q5 is on, turning off Q3. With IRLED/ low, Q1 is turned on, allowing current to pass to the IR LED anode. Q6 is turned off, allowing U3A to pull up the base of Q4 until it conducts. The current path is from VCC, through Q1, the IR LED, Q4 and the sense resistor R1. The voltage across the sense resistor is fed back to U3A, which compares it to the reference voltage and adjusts the drive on Q4 accordingly.

When both IRLED/ and REDLED/ are high, both switches (U4A and U4B) are open and all the drive transistors are off. The voltage divider network, R2 (F4), R4 (G4), and R3 (G4) pulls the reference input of U3A slightly negative. This causes U3A to drive its output negative. However, D1 (E3) prevents the output of U3A from going more than about 0.6 V below ground so that the drive transistors Q3 and Q4 can quickly be turned on when needed.

CPU

Schematic 00950; 7 of 7, Section 2E

U5 (C3) is the CPU, which is the processor used elsewhere in the Propaq. U6 (G2) provides 64 k bytes of ROM. U12 (F3) provides 8 k bytes of RAM. U2 (E2) is an address bus latch controlled by the ALE line (pin 48) of the CPU. U16 (E1) is a shift register allowing the DAC data to be serially shifted out of the CPU into U16 and clocked onto the DAC data lines. U11A (A1) and U11B (A4) provide the REDGATE/ and IRGATE/ signals that control the splitter switches. The rest of the components below the CPU are the typical Propaq reset and startup network. See the Propaq monitor circuit descriptions for details.

SCP Board *Schematic 810-0008-00; 4 sheets, Section 2E*

The SCP board provides the following four functions:

- power to the SpO₂ circuits
- isolation barrier between Propaq and SpO₂ circuits
- transmission of SpO₂ data to monitor processor
- SpO₂ sound generation

Power Supply and Isolation

Schematic 810-0008-00; 2 of 4, Section 2E

The SpO₂ power supply subsystem operates similar to the other power supply subsystems in the Propaq. Battery voltage is supplied to a switching regulator (U2) that generates a pulse waveform on the primary side of T1. The secondary side of T1 uses several taps to generate different voltage levels, which are rectified and filtered as necessary. Feedback regulation is provided through U1 on the isolated side and ISO1 across the isolation barrier.

As with the Propaq monitor, signals crossing the isolation barrier are transmitted and received through opto-couplers.

CPU

Schematic 810-0008-00; 3 of 4, Section 2E

The SCP board's CPU is similar to other Propaq processor configurations. The CPU (U6) is an 80C552 supported by ROM (U11), RAM (U7), and address latch (U9). The CPU processes the SpO₂ data and packetizes it for transmission to the Propaq. The CPU also receives data and information from the Propaq. The information is sent and received via U10.

Sound Generator

Schematic 810-0008-00; 4 of 4, Section 2E

The speaker in the SpO₂ option is driven by a sound generator (U4), which is controlled by a pulse width modulator and filter network.

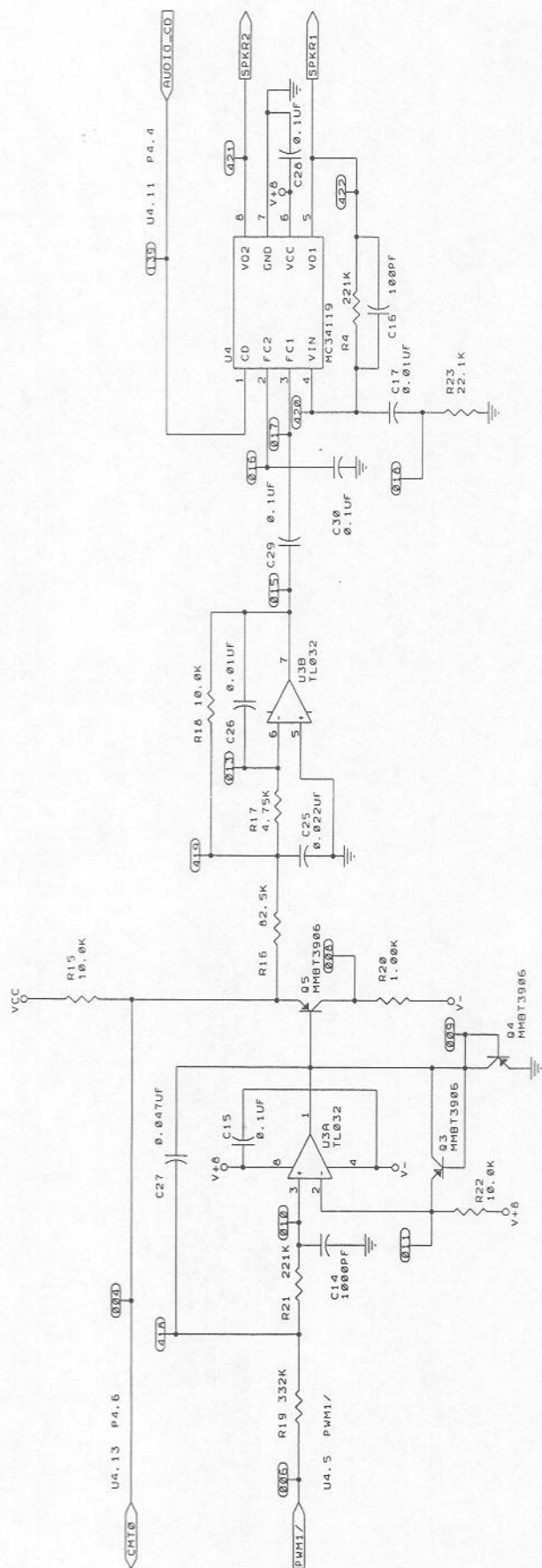
Bill of Materials—Oximeter

CE Drawing Designator (Dwg. #824-0108-01), Oximeter SCP Board 031-0010-02		
Reference Designator	Part Number	Description
	030-0008-00	PCB, SCRAP, BARE
	640-0264-00	LABEL, BAR CODE, PCB'S
	800-0008-00	SCHEMATIC, SCRAP PCB
	824-0108-01	ASSY DWG, SCRAP PCB
C1	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C2	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C3	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C4	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C5	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C6	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C7	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C8	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C9	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C10	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C11	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C12	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C13	250-0022-00	CAP, 56UF, 16V, +/-20%, ALUMINUM ELECTROLYTIC
C14	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C15	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C16	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C17	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C18	261-0007-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1.0UF 10%, 50V, X7R
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C21	261-0008-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .022UF 20%, 50V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C24	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C25	261-0008-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .022UF 20%, 50V, X7R
C26	261-0012-00	CAP, SMD, CERAMIC, .01UF, +/-5
C27	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C28	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C29	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C30	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C31	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C32	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C33	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C34	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C35	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C36	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

CE Drawing Designator (Dwg. #824-0108-01), Oximeter SCP Board 031-0010-02		
Reference Designator	Part Number	Description
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C38	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C39	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C40	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C41	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C42	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C43	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C44	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C45	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
D1	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D2	307-0018-08	DIODE,RECTIFIER,1 AMP,60V,MELF,SCHOTTKY
D3	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D4	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D5	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D6	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D7	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D8	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D9	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
F1	503-0008-00	FUSE, PICO, 3A, 125V
IS01	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
IS02	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
IS03	322-0006-00	PHOTOCOUPLER,PC900V,SHARP
IS04	322-0001-00	PS-2501-2,OPTOCOUPLER,MULTICHANNEL
L1	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L2	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L3	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L4	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
L5	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
P1	610-0086-00	HEADER,12 PIN,DUAL ROW,ST.PIN W/LOCKING CLIPS
P2	610-0049-00	HEADER,2PIN,.100 CTR
P3	610-0069-00	HEADER,14 PIN
P4	610-0085-00	HEADER,6 PIN,SINGLE ROW,ST.PIN W/ LOCK CLIPS
Q1	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
R1	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R2	201-2612-00	RES,SMD,26.1K,1%,0.125W,1206,+/-100PPM/DEG C
R3	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R4	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R5	201-825Z-00	RESISTOR, SMT, 1206 PKG, 82.5 OHM 1%
R6	201-2492-00	RES,SMD,24.9K,.125W,1206
R7	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R8	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R9	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%

CE Drawing Designator (Dwg. #824-0108-01), Oximeter SCP Board 031-0010-02		
Reference Designator	Part Number	Description
R10	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R11	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R12	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R13	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R14	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R15	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R16	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R17	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R18	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R19	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%
R20	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R21	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R22	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R23	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R24	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R25	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R26	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R27	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R28	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R29	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R30	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R31	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R32	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
T1	360-0004-00	XFMR,SA02
U1	473-0003-03	IC,TL431AD,PROGRAMMABLE PRECISION REFERENCE
U2	474-0006-00	IC, LT1172CN8, SWITCHING REGULATOR
U3	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
U4	470-0012-03	IC,SMD,AUDIO AMPLIFIER,MC34119
U5	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U6	440-8055-00	IC,MICROCONTROLLER,8-BIT
U7	430-0002-03	IC,SMT,5565,8KX8 STATIC RAM,200NS
U8	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U9	400-0373-03	IC,SMD,74HC373,OCTAL D-TYPE TRANSPARENT LA
U10	441-0004-02	UART,SCC2691
XU11	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
Y1	502-0013-00	CRYSTAL,10.752 MHZ,PARALLEL MODE,MC49M
Y2	502-0014-00	CRYSTAL,3.6864 MHZ,PARALLEL MODE,HC49M

CW Drawing Designator (Dwg. #824-0204-00), SpO2 Assembly Drawing		
Reference Designator	Part Number	Description
1	010-0048-00	ASSY, EXPANSION CABLE
2	031-0010-02	SUBASSY,PCB,SCRAP,SP02
3	640-0080-00	LABEL,GERMAN SOFTWARE LICENSE AGREEMENT
4	600-0013-00	PAD,FOOT,WHITE,.5" SQ. X.12" HIGH,SILICONE
5	600-0175-00	CORD,O RING,1.6MM (.063)DIA.
6	600-0166-00	O-RING,5 1/4ID,SECTION 1/16
10	650-0003-00	LOCKTITE,THREADLOCKER,ELECTRICAL,222
12	630-0036-00	PANEL,REAR,SPO2
13	630-0037-00	CHASSIS,SPO2
14	640-0064-02	LABEL,DOUBLE BATTERY,REPLACEMENT
15	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
17	640-0205-00	LABEL,SPO2 CONNECTOR PANEL,GERMAN
18	640-0206-00	LABEL,SPO2 REAR PANEL,GERMAN
19	640-0120-00	LABEL, SPO2, FUSE
20	650-0018-00	TAPE, ACRYLIC FOAM, DOUBLE COATED 3/4 X.080
21	352-0002-00	CORE,MAGN,1.50"L,1.00"W,.48"T,.075X1.05"SLOT
22	600-0258-00	GASKET,ADHESIVE,SINGLE SIDED,.062 THICK
23	010-0049-00	SUBASSY, SPEAKER CABLE
24	010-0105-00	SUBASSY,CONN PANEL W/FERRITE BEAD,MOUNTING
25	031-0008-00	SUBASSY,MAIN BOARD,SPO2
26	600-0256-00	CLAMP,FERRITE BEAD
27	600-0182-01	GASKET,SPEAKER
28	620-0106-00	SCREW,4-24,PH,.25L,SLT,TYPE 25,STEEL,ZINC PL
28	620-0175-00	SCREW,4-24X.312,PHL,PHD,TYPE BT
29	610-0078-00	SOCKET, 10 PIN, DUAL ROW, BOARD MOUNT
30	600-0260-00	PIN,BAQPAQ MECHANICAL SUPPORT
31	620-0112-00	WASHER,#2,SHLD,.098ID,NYLON
32	620-0124-00	SCREW, 4-40 X 1/4, PHL, PHD, SEMS
33	630-0035-01	PANEL,SPEAKER SP02
34	630-0038-00	LOCK,"D"CONNECTOR
35	660-0015-00	CABLE, FLEX "D" CONNECTOR, SPO2
35	660-0035-00	FLEX CIRCUIT,SP02,D CONNECTOR
39	680-0016-00	SPEAKER,SP02,BLACK CONE
40	650-0001-00	ADHESIVE, LOCKTITE ELECTROBOND NO. 495
40	650-0029-00	ADHESIVE,416
42	650-0006-00	TAPE,WHITE,PLASTIC,3/4" WIDE
43	650-0007-00	TAPE,BLACK,.750" WIDE
107	640-0070-00	LABEL,PRODUCT SERIAL NUMBER
	824-0204-00	ASSY DWG,SPO2 WITH BEADED SIDE PANEL
U11	433-0196-02	PROM,SCP,6.10.00,PROPAQ1XX



PP-VCC

VHAT-SWT

V-

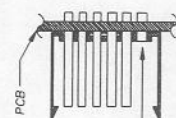
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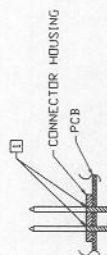
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NOTES: UNLESS OTHERWISE SPECIFIED

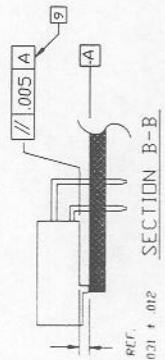
1. PRIOR TO INSERTION, CLIP P1 PINS #3 & #4; AND P4 PIN #6. THEN PULL PINS DOWN SO THAT TOP END OF PINS ARE BELOW TOP OF HOUSING +.000" - .050".
2. NON-DIRECTIONAL COMPONENTS, L1, L2, L3, L4, L5, F1, Y1, Y2.
3. LOAD SURFACE-MOUNT COMPONENTS FIRST, THEN LOAD THRU-HOLE PARTS.
4. COMPONENTS NOT TO BE IMMERSIED IN FREON LIQUID: C1, C2, C3, C4, C5, C6, C7, C8, C9, C13.
5. SQUARE PAD IN PIN #1 FOR MULTI-LEAD COMPONENTS, AND (+) FOR TWO LEAD COMPONENTS.
6. ASSEMBLED BOARD PART NUMBER IS 031-0010-XX. ASSEMBLY VENDOR TO FILL IN LAST TWO DIGITS OF ASSEMBLY PART NUMBER AND REVISION LEVEL OBTAINED FROM BOM, WITH A PERMANENT MARKER.
7. MAXIMUM LEAD LENGTH, SOLDER SIDE IS .070". TRIM LEADS AS REQUIRED.
8. THIS BOARD CONTAINS STATIC SENSITIVE COMPONENTS, AND IS TO BE HANDLED ACCORDINGLY. AFTER ASSEMBLY, PLACE IN STATIC SHIELDING BAG.
9. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
10. THIS BOARD TO BE ASSEMBLED PER IPC 610 STANDARDS, CLASS 2.
11. PLACE BAR CODE LABEL WITH VENDOR SERIAL NUMBER ON COMPONENT U6 AS SHOWN. PLACE QUANTITY AND REVISION LEVEL NEXT TO SERIAL NUMBER. LOCATE SO NOT TO COVER PART NUMBER ON COMPONENT.
12. PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QTY AND REV LEVEL NOT REQUIRED WITH DUPLICATE LABEL.
13. BAR CODE REQUIREMENTS:
 - CODE 39
 - REV. LEVEL (NOT REQUIRED WITH DUPLICATE LABEL)
 - QUANTITY
 - THREE DIGIT SERIAL NUMBER
 - FOUR DIGIT LOT CODE NUMBER
 - VENDOR ID.
14. NO MARKINGS, DISCOLORATIONS OR LOGO'S SHALL BE PLACED IN THE ISOLATION BARRIER. SCRATCH ACCEPTABILITY CRITERIA: THE DEFECT CRITERIA IS HENCEFORTH DEFINED AS THE FOLLOWING:
 - A) IN THE ISOLATION ZONE, IN OR ON THE SOLDERMASK, ANY CONTAMINATION ±.015 INCH MAXIMUM DIMENSION IS NOT ALLOWED.
15. SOLDER MASK DEFECTS IN THE ISOLATION ZONE MAY BE TOUCHED-UP WITH NON CONDUCTIVE MATERIAL. SUCH REPAIRED DEFECTS MUST PASS PROTOCOL SYSTEMS 4.000 VOLT 60 HZ. HI-POT TEST. I) IPC 600, CLASS 2, APPLIES TO ALL OTHER QUALITY ISSUES.
16. PINK RING SPECIFICATION:
 - "PINK RING" SHALL APPEAR NO MORE THEN 0.050" FROM THE EDGE OF ANY PAD AND SHALL NOT BRIDGE MORE THEN 50% OF THE DISTANCE BETWEEN ADJACENT HOLE WALLS.
 - THE DRAWING DESIGNATOR OF THIS ASSEMBLY IS "C6".



SECTION C-C



SECTION A-A



SECTION B-B

<p>PROTOCOL®</p> <p>THIS DRAWING AND CONTENTS INFORMATION IS THE PROPERTY OF PROTOCOL SYSTEMS, INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF PROTOCOL SYSTEMS, INC.</p>		<p>BEAVERTON, OR 97005</p>	
<p>DATE: 8/1/81</p> <p>BY: JRM</p> <p>5/27/81 ASW</p> <p>5/27/81 JRM</p> <p>5/27/81 ASW</p> <p>5/27/81 JRM</p>		<p>PROJECT TITLE: SCRAP PCB ASSEMBLY</p> <p>SYMBOL: D</p> <p>REV: 824-0108-01</p> <p>SCALE: NONE</p> <p>SHEET: 1 OF 2</p>	
<p>DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES ARE:</p> <p>XXX = ± .005</p> <p>XX = ± .01</p> <p>ANGLES = ± 1</p>		<p>DO NOT SCALE DRAWING</p>	

5/09/91	MDB
DO NOT SCALE DRAWING	

ANGLES = ± 1	
------------------	--

3

1

1

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1

4

1

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1

1

5

1

1

1

6

1

1

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1

1

1

1

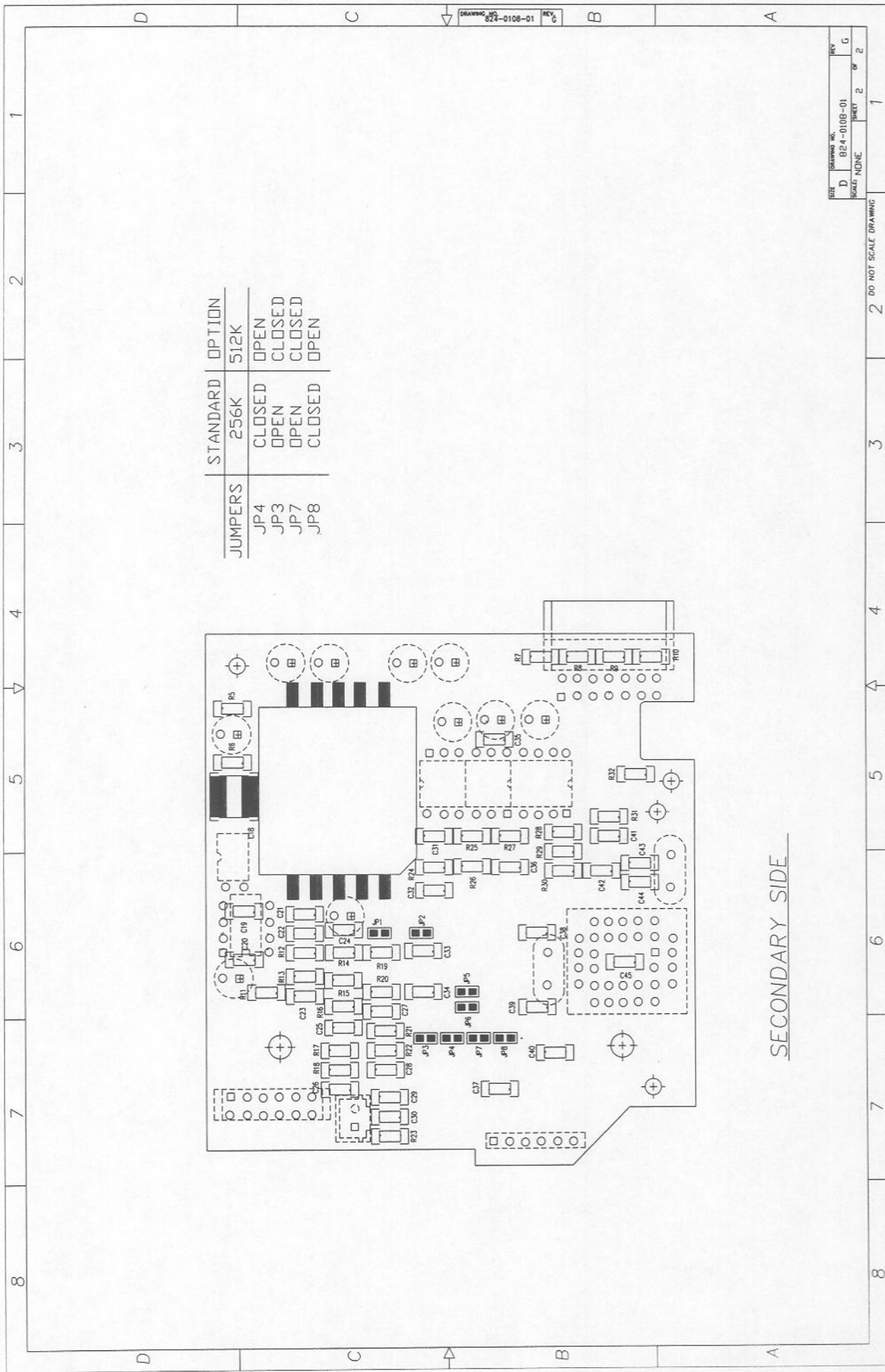
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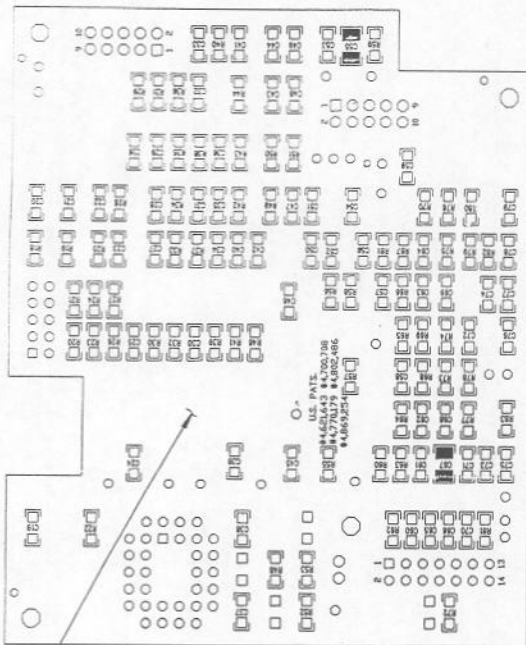
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SECONDARY SIDE

SIZE	D	DRAWING NO.	824-0108-01	REV	G
SCALE	NONE	SHEET	2	OF	2

DO NOT SCALE DRAWING



DETAIL 'A' 10

INSTALL POLARIZING KEY (ITEM 52) AT LOCATIONS JPI, JPI 6
JPS. REFERENCE DETAIL "A".

[illegible]

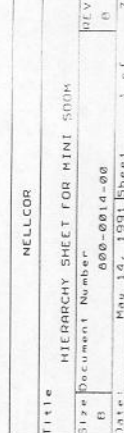
PROTOCOL SYSTEMS, INC.
PART NO. C-1-UCB-00 REV. 1
DESCRIPTION PCB MINI SO
VAULT COPY FILE COPY
PAGE 1 OF 1

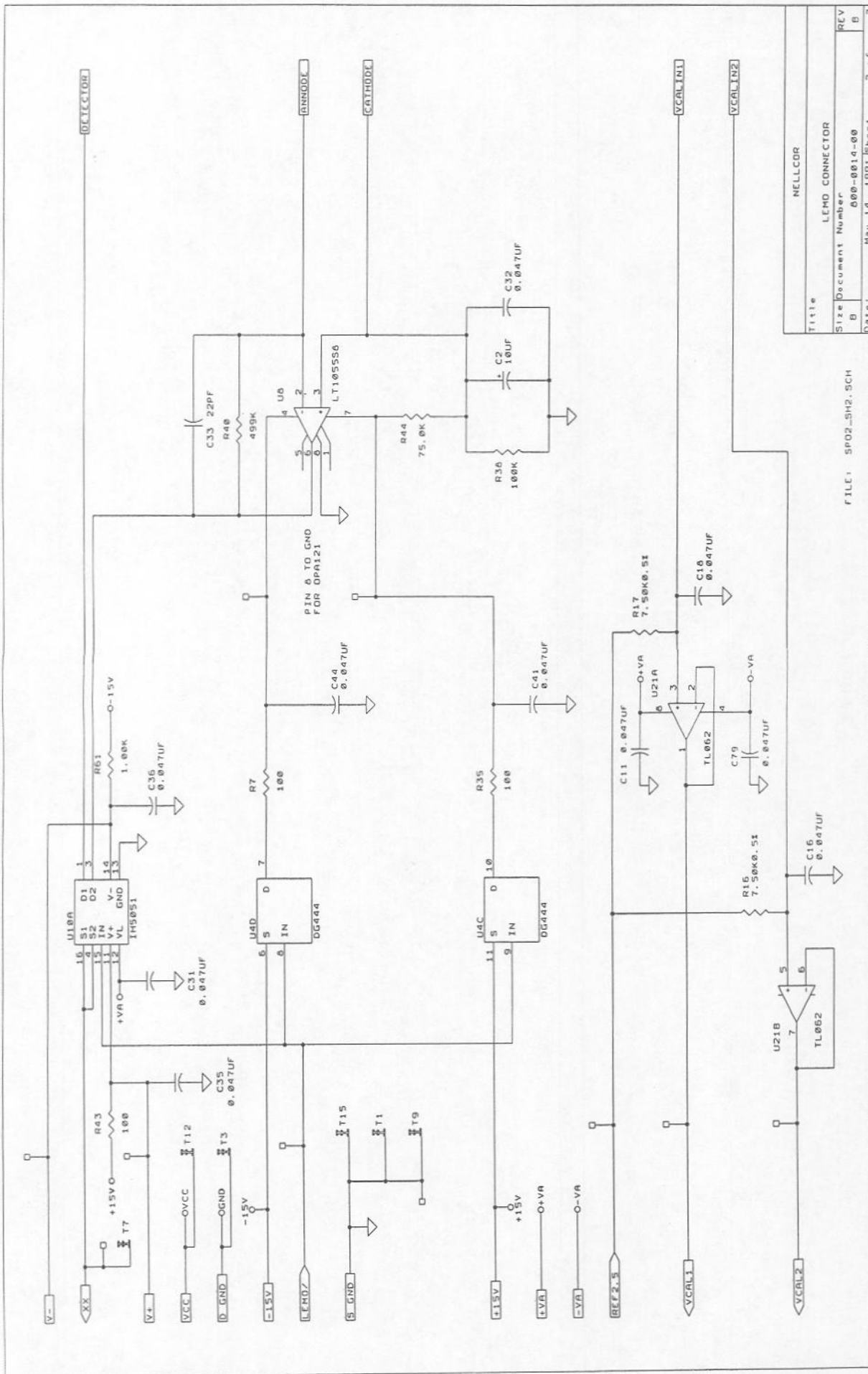
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779770	
NEET ASBY	
IN. TOLERANCES	
UNLESS NOTED	

trial	prob	estimate	\hat{Y}_t	date
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2	0.1			
3	0.1			
4	0.1			
5	0.1			
6	0.1			
7	0.1			
8	0.1			
9	0.1			
10	0.1			
11	0.1			
12	0.1			
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14	0.1			
15	0.1			
16	0.1			
17	0.1			
18	0.1			
19	0.1			
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21	0.1			
22	0.1			
23	0.1			
24	0.1			
25	0.1			
26	0.1			
27	0.1			
28	0.1			
29	0.1			
30	0.1			
31	0.1			
32	0.1			
33	0.1			
34	0.1			
35	0.1			
36	0.1			
37	0.1			
38	0.1			
39	0.1			
40	0.1			
41	0.1			
42	0.1			
43	0.1			
44	0.1			
45	0.1			
46	0.1			
47	0.1			
48	0.1			
49	0.1			
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51	0.1			
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91	0.1			
92	0.1			
93	0.1			
94	0.1			
95	0.1			
96	0.1			
97	0.1			
98	0.1			
99	0.1			
100	0.1			

	NONE	DATE 7/1
	Gordon C. Bishop	DATE 7/1
	DATE 7/1	DATE 7/1

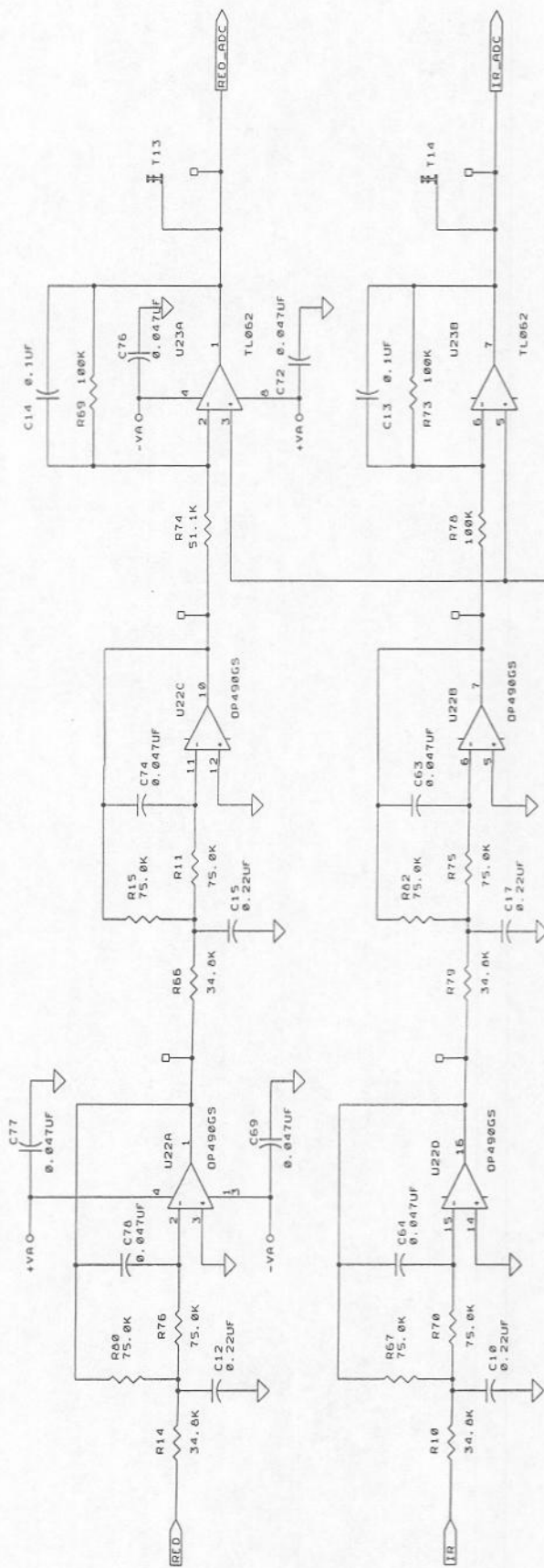
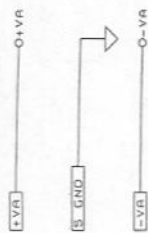
Project & Location	DATE





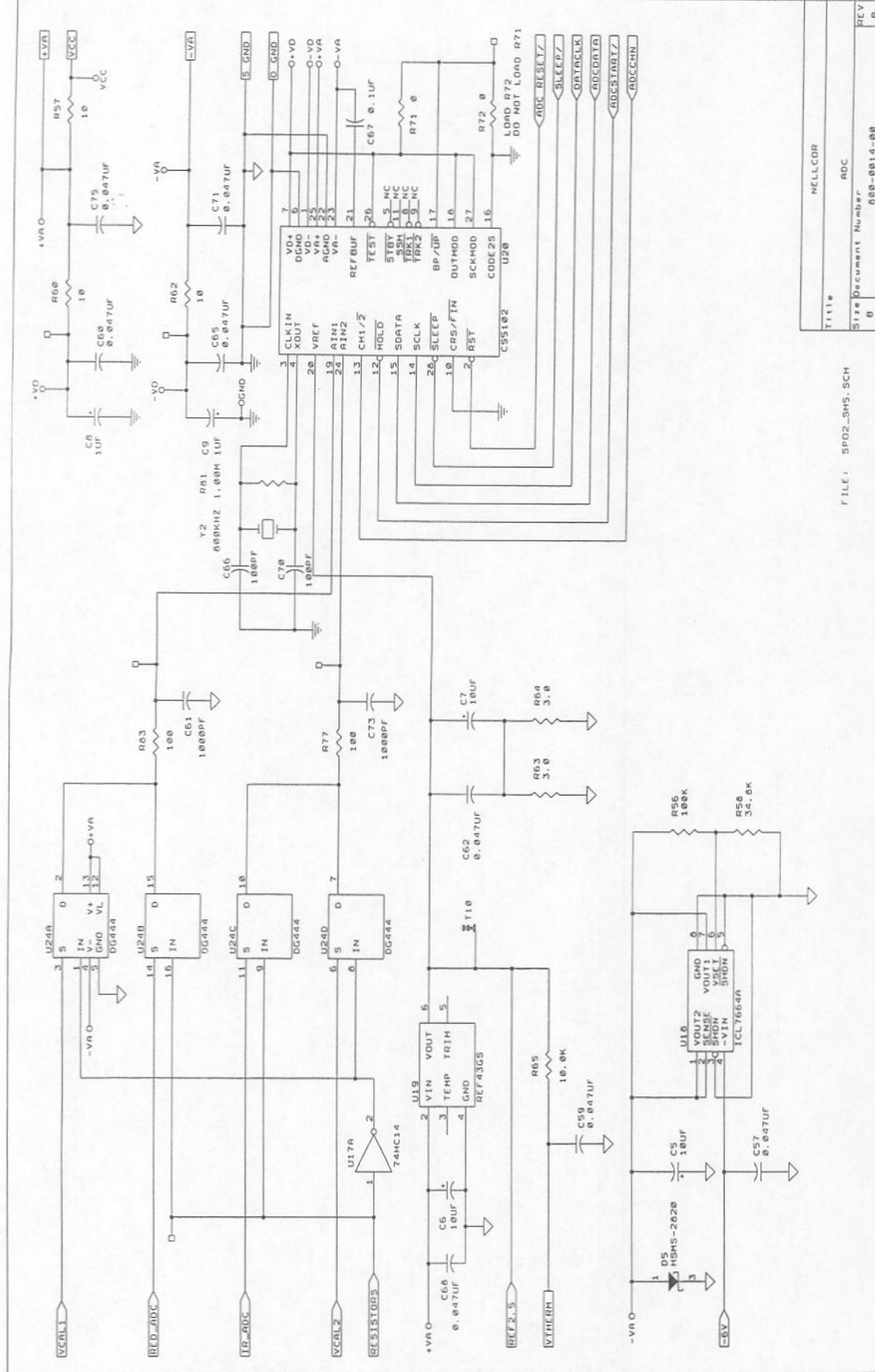
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Size		LEMO CONNECTOR	
Document Number		800-0014-00	
REV		B	
Date:		May 14, 1991	
Sheet		2 of 7	



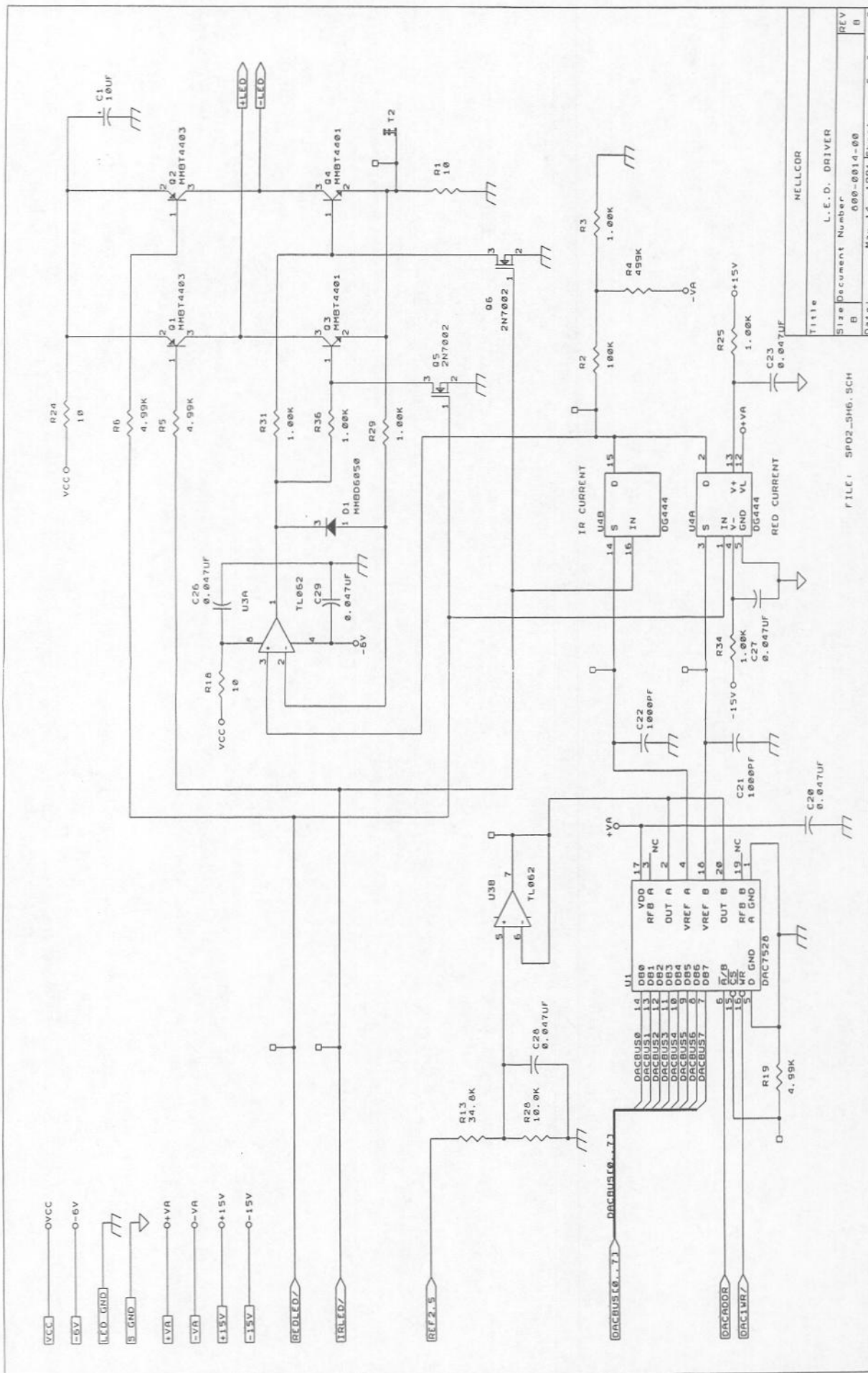
Title	NELLCOR
Size	8
Document Number	000-0014-00
REV	0
Date	May 14, 1991
Sheet	4 of 7

FILE: SPO2_3M4.SCH



FILE: SPO2-SHS-SCH

Title		NELLCOR	
Size		A0C	
Document Number		000-0014-00	
REV	B	Date	May 18, 1991
Sheet		5 of 7	



FILE: SP02_3HG.SCH

Title	NELCOR
Size	B
Document Number	000-0014-00
REV	0
Date:	May 14, 1991 Sheet 6 of 7

REV.	CHANGE NUMBER	DATE	CHECKED BY
E	CO 930046	CLG	3/2/93
F	CO 930281	CLG	3/2/93

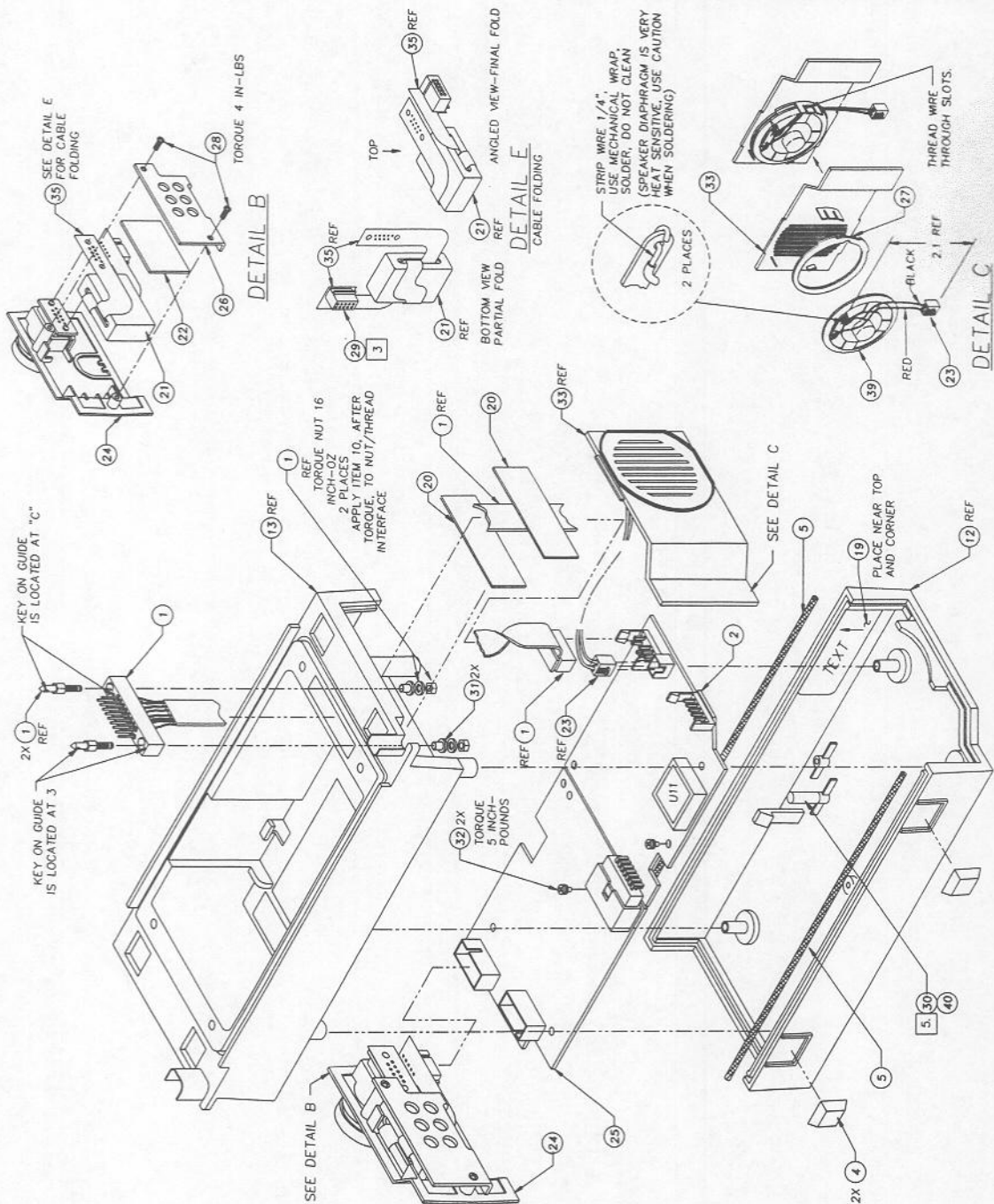
NOTES: UNLESS OTHERWISE SPECIFIED

- ITEMS 3, 7, 8, AND 9 ARE NOT ASSEMBLED INTO THE UNIT WHEN THE BAGPACK IS SHIPPED ALONE.
- INSTALL ITEM 34 AFTER ITEM 17, FOR OXIMETERS FOR PROPAQS SIEMENS ONLY; PUT ITEM 34 IN ITEM 41 AND SEND WITH UNIT TO PACKAGING.
- SOLDER PINS TO FLEX CABLE USING SOLDERING IRON WITH 575° FAHRENHEIT TEMPERATURE. DO NOT SOLDER FLEX CABLE THAT HAS BEEN EXPOSED TO HUMIDITY DURING STORAGE. CLEAN SOLDERED AREAS ON FLEX CABLE WITH FREON, ACID BRUSH, AND KIM Wipe. CAUTION: EXCESS FREON CAN CAUSE DAMAGE TO THE PLASTIC PANEL.
- DRAWING DESIGNATOR OF THIS ASSEMBLY DRAWING IS "CW".
- SECURE PIN, ITEM 30, IN BOSS WITH LOCTITE 416 ADHESIVE.
- TORQUE TOLERANCES ARE ±5%.

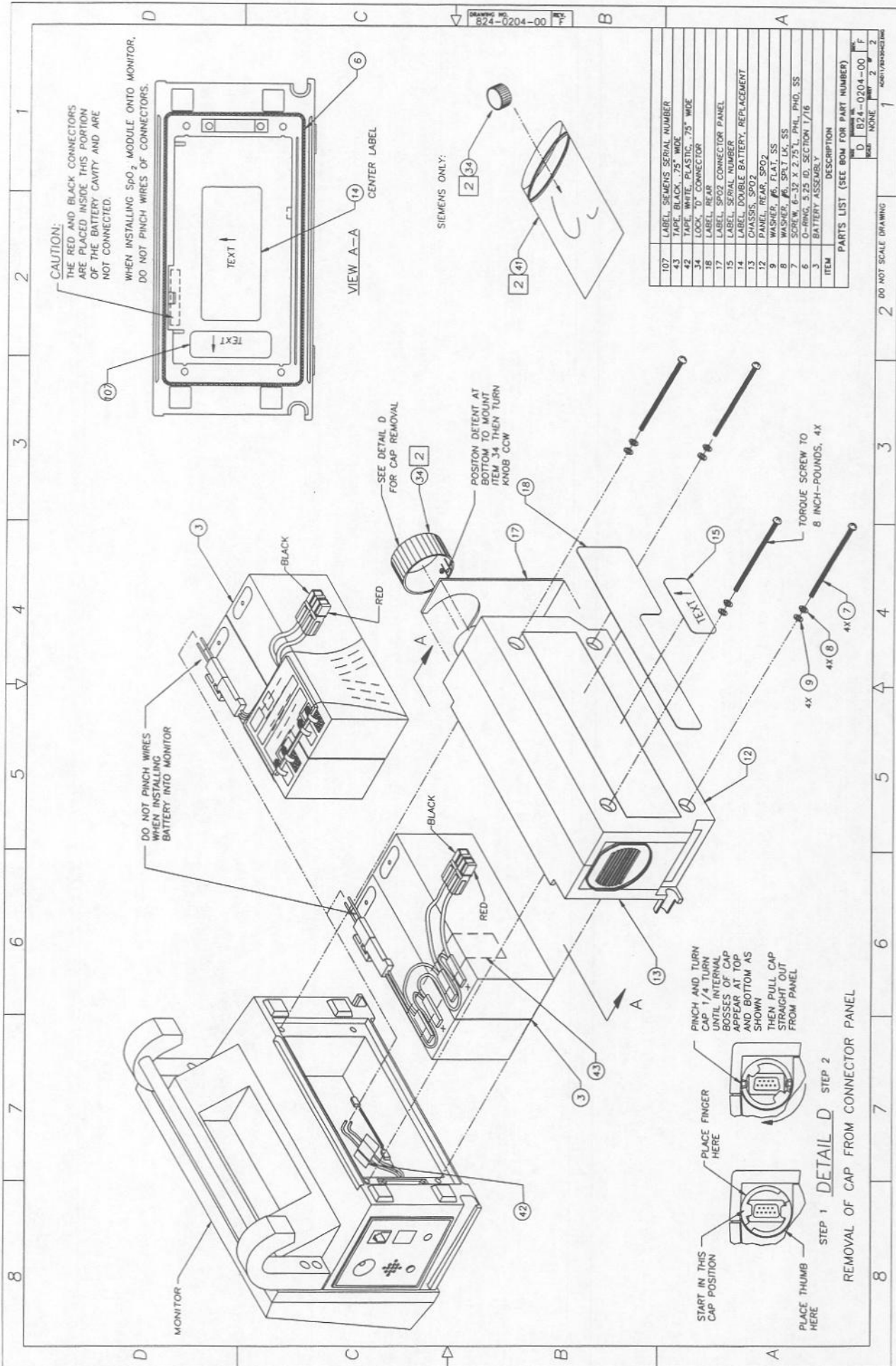
DRAWING NO. 824-0204-00

ITEM	DESCRIPTION
41	ZIPLOCK BAG 3"x5"
39	SPEAKER, LOCTITE 416
35	FLEX CIRCUIT, SP#2, D CONNECTOR
33	PANEL, SPEAKER SP#2
32	SCREW, #4-40x.25", PHIL, PHD, SEMS
31	WASHER, #2, SHLD, .089 ID, NYLON
30	SECURE PIN TO PIN DUAL ROW BOARD MOUNT
28	SCREW, #4-24, PH, .31" SLT, TYPE B7
27	GASKET, SPEAKER
26	CLAMP, FERRITE BEAD
25	SUBASSEMBLY, MAIN BOARD, SP#2
24	SUBASSEMBLY, CONN PANEL
23	SUBASSEMBLY, SPEAKER CABLE
22	GASKET, ADHESIVE, SINGLE SLOTTED, .062 THICK
21	CORE, MAGN, 1.01", 1.5" W, .481, .075x1.05 SLOTT
20	TAPE, ADHESIVE, FOAM DOUBLE COATED 3/4" x .080
19	CABLE, SP#2, FUSE
18	CABLE, REAR SP#2
17	PANEL, REAR SP#2
16	ADHESIVE, LOCTITE 4222
15	O-RING CORD, .070" OD
14	FOOT, PAD, WHITE, .30" x .12" H, SILICONE
13	SUBASSEMBLY, PCB, SCRAP, SP#2
12	ASSEMBLY, EXPANSION CABLE
11	ITEM

ITEM	DESCRIPTION
1	ASSEMBLY, EXPANSION CABLE
2	SUBASSEMBLY, PCB, SCRAP, SP#2
3	FOOT, PAD, WHITE, .30" x .12" H, SILICONE
4	O-RING CORD, .070" OD
5	CABLE, REAR SP#2
6	CABLE, SP#2, FUSE
7	PANEL, REAR SP#2
8	ADHESIVE, LOCTITE 4222
9	TAPE, ADHESIVE, FOAM DOUBLE COATED 3/4" x .080
10	CORE, MAGN, 1.01", 1.5" W, .481, .075x1.05 SLOTT
11	GASKET, ADHESIVE, SINGLE SLOTTED, .062 THICK
12	SUBASSEMBLY, SPEAKER CABLE
13	SUBASSEMBLY, CONN PANEL
14	SUBASSEMBLY, MAIN BOARD, SP#2
15	CLAMP, FERRITE BEAD
16	GASKET, SPEAKER
17	SCREW, #4-24, PH, .31" SLT, TYPE B7
18	SECURE PIN TO PIN DUAL ROW BOARD MOUNT
19	WASHER, #2, SHLD, .089 ID, NYLON
20	SCREW, #4-40x.25", PHIL, PHD, SEMS
21	PANEL, SPEAKER SP#2
22	FLEX CIRCUIT, SP#2, D CONNECTOR
23	SPEAKER, LOCTITE 416
24	ZIPLOCK BAG 3"x5"



2 DO NOT SCALE DRAWING



2F—Capnograph (CO₂)

Detailed Circuit Descriptions

This section provides detailed descriptions of the CO₂ circuitry. Component designators found on the schematics in this section are used in this description to identify components. Grid locations of the components on the schematics are indicated in parentheses, for example (Sheet 5, C6).

Hierarchy Diagram *Schematic 800-0032-00, Sheet 4 of 12*

The Hierarchy diagram contains the overall collection of schematics which describe the entire electrical system. The isolation barrier is not shown on this sheet.

Speaker/Sync Circuitry *Schematic 800-0032-00, Sheet 9 of 12*

U15 port bits P4.6/CMT0 and P4.7/CMT1 (Sheet 5, C6) into the speaker driver circuit (Sheet 9, C1 & D1) control the speaker frequency and volume. A square wave of the appropriate frequency is commanded from either, both, or neither port pins. The four combinations yield four signal volumes, including no volume, as shown below.

CMT0	CMT1	Volume
high	high	no sound
high	desired frequency	medium level sound
desired frequency	high	low level sound
desired frequency	desired frequency (in phase)	high level sound
static low	don't care	not allowed
don't care	static low	not allowed

Use of disallowed states results in improper volume. The optocouplers are on when either signal is low, causing a small but unnecessary power drain on the Propaq.

The SYNC signal (Sheet 10, D8) originates in the DAP and is routed to the Nellcor Mini Soom circuit board for the SpO₂ C-lock function. SYNC is passed through an optocoupler (U11) which is on only when the signal is active, minimizing power consumption.

CO₂ Waveform Schematic 800-0032-00, Sheet 6 of 12

Circuitry

Detector Amplifier

The detector amplifier increases the Pryon detector signal, DET_OUT (Sheet 6, D8), by a gain factor of 3.

The DET_OUT signal is conditioned by a single-pole low-pass filter located at 485 Hz, before it is presented to the non-inverting input of the detector amplifier, U35A.

Detector Supply

The detector supply refers to the -42 volt supply needed to bias the lead selenide infrared detector resident in the Pryon sensor. The series pass optocoupler transistor acts as a variable voltage dropping resistor, which is used to adjust the dark level voltage of the detector signal.

Normal operating voltage of the -BIAS (Sheet 6, D1) voltage is between -10 and -30 V.

Detector Gain Circuitry

The detector signal, DET_OUT, can be solved by summing the currents into the op amp within the Pryon sensor:

$$\frac{\text{DET_OUT}}{1000000} + \frac{\text{PLUS_BIAS}}{2500+2500+15000} - \frac{\text{MINUS_BIAS}}{\text{DET_RESISTANCE}} = 0$$

$$\text{DET_OUT} = -50 \cdot \text{PLUS_BIAS} - 1000000 \cdot \frac{\text{MINUS_BIAS}}{\text{DET_RESISTANCE}}$$

Pryon keeps the detector resistance nominally between 200 and 500 KΩ.

PLUS_BIAS, or +BIAS (D1), is specified as a voltage between 0 and 2.5 Vdc, as read by a byte from the Pryon sensor's EEPROM. This gives Pryon the ability to adjust the detector gain to compensate for variations in detector sensitivity.

In series with the optocoupler transistor are R101 (10K resistor) and C28 (100 mF capacitor). The large capacitance of C28 maintains a constant voltage on the detector element. To negatively charge up this capacitor, the charge time constant is about 1 second. To naturally discharge (C28) can take as long as 50 seconds for one time constant.

Dark Level Error Correction Circuitry

After power up, or whenever a sensor is connected, C28 rises to its maximum negative value. Before the bulb is turned on, the detector voltage is indicative of the dark level which is the level present when the bench rotor blocks the IR source from the IR detector. When the DETENT port pin (Sheet 5, C6) is asserted, the high voltage transistor discharges C28 through R128 (1K resistor). The discharge time constant during DETENT

assertion is 100 ms. This allows the software to quickly set the dark level to the desired 326 mV level expected and controlled by the hardware, before the IR source is actually turned on.

Once the bench rotor has come up to speed and the IR source has been turned on, the dark level is adjusted once each bench rotor revolution. This is done by the CPU asserting the SERVO_DARK signal (Sheet 6, C8) for a 500 ms period, only when the bench rotor is blocking the IR source. The FET (Q12) allows the actual dark level amplified detector voltage, VSIG, to be compared against a 326 mV tap created by a resistor division. Any small error in the actual dark level causes a constant current level in the LED of an optocoupler to either increase or decrease. This error is integrated during the time when SERVO_DARK is asserted. When the SERVO_DARK signal is deasserted the LED drive op amp (U30A) acts like a hold circuit, holding the new constant current level in the optocoupler LED (U26).

When the current level in the optocoupler's LED changes, an inversely proportional voltage drop is effected in the optocoupler's transistor. By effectively changing the voltage across this transistor, the amount of bias voltage on the detector causes a voltage shift in the operating point of the detector amplifier. This shift occurs in the appropriate direction such that the error in the actual dark level is slightly decreased at each bench revolution after SERVO_DARK is deasserted.

Valid Waveform Points

For each CO₂ waveform point to be valid, the following input parameters to the CO₂ calculation routine must be true:

Vpeakhi < 4086 counts.

Vpeakhi > x counts.

Vdark < 500 mV (245 counts of the 12 bit converter.)

Vtemperature > 36° C, but < 50° C.

For CO₂ numerics to be true, all of the above conditions must be true plus:

Vtemperature must have reached 42°, if the thermistor was cooler when first detected.

Temperature Circuitry

Schematic 800-0032-00, Sheet 3 of 12

The infrared detector is composed of PbSe, lead selenide, and as such the responsivity (or gain) is a function of temperature. The Pryon algorithm must have temperature to be able to calculate the correct amount of CO₂.

The Pryon sensor contains a Fenwal thermistor, 192-303KET-0A1, one side ground referenced. The required accuracy for the Pryon algorithm is 0.25° C; our measurement accuracy is better than 0.05° C.

If the temperature of the Pryon sensor goes above 46° C, operation of the CO₂ subsystem is halted to avoid overheating the rotor sapphire bearings.

Barometer Circuitry *Schematic 800-0032-00, Sheet 8 of 12*

The barometer is used for correcting the calculated amount of CO₂ in mmHg for "pressure broadening". The pressure broadening error can be as high as 15% of the reading. See PB_GR2.MCD for graph of corrections.

The barometer is also used when the operator selects Per Cent CO₂ as the desired patient unit for display of ETCO₂ and INCO₂. The following formula converts mmHg of CO₂ to Per Cent CO₂.

$$\text{Per_Cent_CO2(mmHg_CO2,baro_pressure):} = \frac{\text{mmHg_CO2}}{\text{baro_pressure}}$$

The barometer circuitry uses an ICSensor 1220A 15psi absolute pressure transducer. This sensor has a raw full scale output error of 1% when the circuit design uses the current set resistor supplied by the manufacturer.

When the current set resistor measures 1.235 V, all given transducer specifications are valid. This voltage is created by a precision resistor divider pair (0.02% tolerance). If 1% resistors were used the gain of the transducer could directly be changed by 2%. (The reference voltage, 1.235 V, is supplied by VREF, a 5 volt reference voltage. This voltage also controls the span of the A/D converter, and therefore does not enter into the gain equation, because all A/D counts are ratiometric to this supply.)

After having established the correct current to energize the pressure transducer bridge, the positive measurement arm of the bridge is referenced to VREF. This is done by dropping an amount of voltage (created by the reference current) across a FET, raising the bridge measurement arms.

The final op amp amplifies the difference between the measurement arms using two 0.1% tolerance resistors. Offsets are tweaked out using a buffered pot and series impedance in parallel with a bias resistor to ground.

Analog to Digital Converter *Schematic 800-0032-00, Sheets 5 and 6 of 12*

There are two A/D converters on the isolated section of the MSP PCB. One is the AD7880, a more accurate 12 bit converter used to convert the VSIG detector signal and the bench temperature. The second is the on-board A/D converter resident within the 552 processor (Sheet 5 of 12), with its lower accuracy 8-10 bit converter.

AD7880

The AD7880 can be used in a variety of ways. The following Operation section details the particular set up and operation factors for the converter. The Analog Devices Data book should be consulted for more detail. The second section describes buffering, clamping, and other factors relating to the multiplexed signals.

Operation

The converter will A/D convert signals ranging between 0 V to 5 V. This is selected by tying VINA to VINB.

The A/D converter cannot be used until the SOURCE_ENA signal is asserted raising the MODE pin to a logic high. Until then, the A/D converter consumes 2 mW in a power down mode. The A/D converter normally consumes 25 mW. One dummy conversion is required after the converter exits the power down mode.

The references for the converter are VREF and A_GND.

The required CLKIN signal is provided by PSEN. During a conversion a maximum of 28 cycles are required. Since there are 2 PSEN cycles per instruction cycle, 15 instruction cycles are required for a total of 16.5 msecs. No external memory access can be made during this time to insure that CLKIN stay within its tolerable duty cycle limit.

Buffering/Clamping from MUX

The 4051 Analog Multiplexer selects one of eight signals to present to the A/D converter. The desired channel is selected using MUX2, MUX1, and MUX0 (MUX2 is the most significant bit.) The multiplexer can accept inputs in the range from ≈ 10 V to -6 V.

Once the multiplexer has been selected, a total settling time of 20 micro seconds are required before beginning an A/D conversion.

The output of the mux is buffered by an op amp whose minus rail is ground, protecting the A/D from underdriving. The input to the buffer op amp is clamped to VREF by an ideal diode op amp to prevent any signal from overdriving the input buffer, which would overdrive the A/D input. Suitable guarding protects the input buffer's non inverting input back to the multiplexer's output.

Signals

The following are presented to the A/D converter through the multiplexer:

Channel:	Signal:	Voltage Range:	Comments:
0	VSIG	0v to 5.85v	
1	ALTITUDE	0v to 5.85v	
2	TEMP	0v to 5.00v	
3	REF2.5V	2.5v ± 0.025	
4	ALT_REF	1.231v ± 0.025	May be used to correct all A/D conversions.
5	BIAS_TEST	0v to 2.710v ± 0.025	
6	+5.25V_REP	4.773v ± 0.025	
7	A_GND	0v ± 0.010	

Motor Drive Circuitry *Schematic 800-0032-00, Sheet 7 of 12*

The motor drive system rotates the bench rotor at a rate of 30.0 ms per revolution. During each revolution, there are six position interrupts, three on positive-going and three on negative-going edges of MAG_SENSE. The drive voltage to the DRIVE signal can be 5.25 V, 0 V, or -6 V.

Motor Drive Methodology

Shortly after power up or whenever a Pryon transducer is plugged into the Propaq EM, the rotor must be placed into a starting position before it can be spun up to speed.

The DETENT signal, when asserted high causes DETENT_QBAR to go low. DETENT_QBAR will stay low for a period of about 50 ms, as governed by a 74HC123 one shot. If the DETENT signal should be deasserted before the one shot times out, DETENT_QBAR will immediately return to its high unasserted state. The one shot prevents the Sense Coil from being asserted too long, avoiding excessive heating and possible destruction of the coil.

DETENT_QBAR energizes a Darlington PNP transistor which allows current to flow into the Sense Coil. While this current is flowing, a magnetic field is established around the Sense Coil. The Sense Coil field attracts one of the three rotor magnets to one end of itself, thereby turning the rotor to its initial position.

After the DETENT signal has been applied for a suitable length of time, 10 to 100 ms, establishing the rotor initial position, the DRIVE signal can be asserted.

To drive the rotor, two signals are used (as shown below), MOTOR_DRIVE and NEG_MOTOR_DRIVE.

<u>MOTOR_DRIVE</u>	<u>NEG_MOTOR_DRIVE</u>	<u>DRIVE</u> Coil Voltage
0	0	0
1	0	5.25
0	1	-7
1	1	0

To prevent overheating and possible destruction of the Drive Coil, when the rotor is stopped, a one shot will cause the Drive voltage to go to 0 V, unless the one shot is kept active (as it must be during proper operation). The SERVO_DARK signal must toggle before a 50 msec one shot timer times out. During normal operation, the SERVO_DARK signal is asserted for 0.5 msec each 30 msec, keeping the Drive from inhibiting.

During normal operation MOTOR_DRIVE is asserted after a delay from the falling edge of MAG_SENSE, and deasserted at the rising edge of MAG_SENSE. NEG_MOTOR_DRIVE is asserted following a delay from the rising edge of MAG_SENSE and deasserted at the falling edge of MAG_SENSE. For some benches having very low friction both MOTOR_DRIVE and NEG_MOTOR_DRIVE may be very short. Some benches will not need both polarities of Drive voltage.

Position Sensing Circuitry

The position sensing circuitry determines the angular position of the bench rotor for the purpose of driving the bench rotor motor, and providing sampling marks for timing A/D conversion on the IR detector signal, VSIG.

The three magnets, located at 120 degrees apart on the rotor, pass the Sense Coil inducing a time varying voltage depending on speed. The SENSE signal amplitude is proportional to the bench speed. For this reason the first stage of amplification is a low pass filter, which provides additional gain for the slowly spinning rotor. Once the rotor is up to speed the SENSE signal is approximately 30 mV peak to peak. The second stage filter acts like a comparator with hysteresis. The final transistor translates the amplified signal into a digital square wave signal, MAG_SENSE.

Infrared Source Circuitry

Schematic 800-0032-00, Sheet 3 of 12

This section details the Infrared source drive circuitry and how the Mainstream Sensor is detected.

The SOURCE or Bulb drive is the current used to turn on the Pryon infrared source which is, in actuality, a grain of wheat incandescent bulb. This bulb can be directly observed. Only a very small percentage of light energy is allowed through the 4.26 μm optical bandpass notch filter.

Source (Bulb) Drive Circuitry

The SOURCE can be turned off by deasserting SOURCE_ENA. This causes the non inverting input of the op amp to always be greater than the inverting input, which biases off the source drive transistor, preventing any current from going to the source.

When SOURCE_ENA is asserted (high), the resistor divider establishes a voltage 830 mV below the 5.25 Volt supply. This voltage will also appear across the 10 Ω measurement resistor, as regulated by the op amp.

With the required 83 ma \pm 3 ma of current flowing into the bulb, the bulb is not bright white, not white, not yellow: it is fairly bright yellow-white. The heat generated by the SOURCE signal within the Pryon sensor will increase the sensor about 6° C above ambient.

Main Stream Sensor Detection

Every second the software checks for the presence of the Pryon sensor. Before performing the check, the signal SOURCE_ENA, is asserted. The following table details the voltages, read at SOURCE_ADC1, with the sensor present or absent.

Pryon Sensor Presence:	Expected Voltage or Range:
Pryon Sensor Absent	4.8 V
Pryon Sensor Present	<3.9 V

SOURCE_ENA is deasserted after reading the A/D voltage.

During normal operation, SOURCE_ADC1, is read to ensure the presence of the Pryon sensor.

Heater Circuitry *Schematic 800-0032-00, Sheet 7 of 12*

The purpose of the Heater is to ensure that the Pryon sensor is at least 42° C during normal operation. Normal body temperature of 37° C warms exhaled gases to this temperature while humidifying the gas. The Heater warms the cuvette sapphire windows to 5° C above body temperature to dry these windows, or to ensure that no condensation forms on these windows.

When the ambient temperature is about 36° C, the SOURCE can maintain the Pryon sensor at 42° C without activating the Heater.

Heater Software Details

The Heater is controlled by a software PWM, pulse width modulation, port pin signal, PWM1/. PWM1/ can take on 256 duty cycles, covering 0 to full, in 1/255th increments. During normal operation, the duty cycle can only change by a maximum rate of 1/255th per 5 msec period. This is done to avoid extreme load changes to the power supply resulting in glitching the SpO₂ supplies past tolerable limits.

The following equations list charge/discharge time constants with and without the Pryon sensor.

$$R_{\text{series}} = 0.5 \qquad C_{\text{total}} = 0.002$$

No load charge time constant times 3 at minimum duty cycle: $DC = \frac{1}{255}$

$$tc3 = \frac{3 \cdot R_{\text{series}} \cdot C_{\text{total}}}{DC} \quad tc3 = 0.765 \quad tc3 \text{ is about } 0.8 \text{ secs.}$$

No load charge time constant times 3 at maximum duty cycle: $DC = \frac{255}{255}$

$$tc3 = \frac{3 \cdot R_{\text{series}} \cdot C_{\text{total}}}{DC} \quad tc3 = 0.003 \quad tc3 \text{ is about } 3 \text{ msecs.}$$

No Sensor Present Discharge time constant:

$$dte_no_sensor = 200000 \cdot C_{\text{total}} \quad dte_no_sensor = 400 \text{ seconds}$$

Sensor Present Discharge time constant:

$$dte_ys_sensor = 10 \cdot C_{\text{total}} \quad dte_ys_sensor = 0.02 \text{ seconds}$$

The software has a heater task which runs every 5.5 msecs. This task compares the desired duty cycle with the actual duty cycle of PWM1/. If the desired is less than the actual, then the actual is decremented. If the desired is greater than the actual duty cycle, then the actual is incremented.

If the sensor has just been detected, and UP_TO_SPEED is false (not up to speed yet), and the temperature is less than 41° C, the motor can be started.

The actual Heater Drive Circuit is a dc to dc buck converter. A dc level is established and current is delivered to the Pryon heater. The primary coil is a torroid wound inductor to minimize the EMI fields which would otherwise occur if the inductor were wound on a length of ferrite material.

PWM1/ is inverted and applied to the input of a FET driver IC. When the power is applied to the processor the port pin is pulled high, ultimately turning the FET off. The FET gate resistor minimizes transient oscillations during turn on/off.

If the PWM output is greater than 20 counts and the ADC0, HEATER voltage, is less than 20 counts, then a fatal error should result.

Over Temperature Cutout

Single fault tolerance has been provided to eliminate the possibility of a heater runaway problem which could burn the patient.

If the primary FET should fail in a shorted condition, a second hardware controlled series FET prevents thermal runaway. The thermal cutout temperature is 47.2° C. (The range, considering battery voltage and component tolerances, is 46.5 to 47.5° C.) The thermal cutout is reenabled when the temperature decreases to 43.7° C (ranging from 42.7 to 44.4° C.)

If the thermistor is at fault, software will try energizing the heater for only a minute. IF 1) {a sensor is detected}, AND 2) {the temperature is 40° C}, AND 3) {neither the bulb nor the heater increases temperature}, AND 4) {two minutes have elapsed since the sensor was detected}, THEN {Display a CO₂ sensor thermistor failure Equipment Alarm}.

By not updating the SERVO_DARK signal, the one shot time out period which disables driving any voltage to the motor coil also prevents the second FET from allowing current into the heater. The bench motor must be spinning to allow the heater to be energized.

CPU Circuitry *Schematic 800-0032-00, Sheet 5 of 12*

The CPU circuitry includes the 552 microcontroller, 32K of RAM, 64K of ROM, a UART, and an external A/D converter/latch combination. The external non-ROM address space accesses the following parts at the defined addresses, below:

Device:	Address:
RAM	0000h to 7FFFh
UART	CXXXh
A/D Converter (8 least significant bits)	AXXXh
A/D Converter Latch (4 most significant bits)	9XXXh

Initialization and Power Up Mode

At power up the Propaq sends a reset signal to the MSP PCB (AUX_RST) which holds the microcontroller in reset for a period greater than a half second.

The processor hardware watchdog timer is enabled. The customary RAM tests are performed to verify RAM integrity. All hardware controlling port bits are initialized. All power supplies which have A/D inputs are checked for integrity.

The AD7880 A/D converter is checked for accuracy against known voltage points. A linearity check is made by comparing and inputting a ramp into the converter.

Port	Pin	Signal	Description
P0/AD0-AD7	57-50	Address/Data Bus	
P1.0/CT0I	16	MAG_SENSE	Bench Rotor Position Interrupt
P1.1/CT1I	17	BUSY/	A/D Converter is busy when low
P1.2/CT2I	18	BUSY/	A/D Converter is busy when low
P1.3/CT3I	19	BUSY/	A/D Converter is busy when low
P1.4/T2	20	SOURCE_ENA	Command the IR Source (Bulb) to turn on.
P1.5/RT2	21	CONVST/	Command the A/D Converter to start a conversion.
P1.6/SCL	22		
P1.7/SDA	23		
P2/A08-A15	39-46	High Address Bus	
P3.0/RXD	24	RXD_ISO	Propaq IPC TXD bus.
P3.1/TXD	25	TXD_ISO	Propaq IPC RXD bus.
P3.2/INT0	26	DETENT	Command the bench to its starting position.
P3.3/INT1	27	UART_INT/	The Uart interrupts the MSP with this line.
P3.4/T0	28	UART_RESET	The MSP resets the Uart with this line.
P3.5/T1	29		
P3.6/WR	30	WR/	
P3.7/RD	31	RD/	
P4.0/CMSR0	7	MOTOR_DRIVE	Drive positive current into the bench drive coil.
P4.1/CMSR1	8	NEG_MOTOR_DRIVE	Drive negative current into the bench drive coil.
P4.2/CMSR2	9	SERVO_DARK	Command the VSIG dark level to adjust.
P4.3/CMSR3	10	MUX0	A/D Multiplexer channel select low bit.
P4.4/CMSR4	11	MUX1	A/D Multiplexer channel select middle bit.
P4.5/CMSR5	12	MUX2	A/D Multiplexer channel select high bit.
P4.6/CMT0	13	CMT0	Speaker Command line 0.
P4.7/CMT1	14	CMT1	Speaker Command line 1.

Port	Pin	Signal	Description
P5.0/ADC0	1	HEATER_ADC0	Heater Output voltage.
P5.1/ADC1	68	SOURCE_ADC1	Source Output voltage
P5.2/ADC2	67	ADC2	+15v and -15v
P5.3/ADC3	66	ADC3	VREF and -6v
P5.4/ADC4	65	ADC4	+7v and -7v
P5.5/ADC5	64	ADC5	+5.25v and -42v
P5.6/ADC6	63	+BIAS_TEST	Detector Positive Bias Voltage
P5.7/ADC7	62		
EA/	49		
PWM0/	4	PMW_VSIG_GAIN	Set IR Detector Gain according to Sensor EEPROM.
PWM1/	5	PMW1/	PWM used to develop a dc Heater Voltage.
AVREF+	59		Internal A/D +5 volt filtered Reference.
AVREF-	58		Internal A/D D_GND Referenced.
STADC	3		External Start A/D not used.
RST	15		Processor Reset.
EW/	6		Hardware Watchdog is enabled.

Power Supply Circuitry *Schematic 800-0032-00, Sheets 11 and 12 of 12*

Overview

The switching power supply portion of the power supply is a multiple output flyback converter. The isolated +5.25V secondary is regulated and an optocoupler used to feed back the output of the error amplifier to the primary side where the controller I.C. is. The outputs of the switching power supply are regulated by linear regulators as required to meet supply noise requirements.

The switching power supply controller is a current mode controller in a TO-220 package.

Frequency is a nominal 100 kHz +12%, and will vary between 85 kHz and 115 kHz as temperature varies from 0 to 100° Celsius.

The switching power supply controller is mounted to a heat sink for mechanical support and thermal heat sinking.

The transformer is a multiple output flyback converter transformer. The primary inductance is 36.0 μ H +10% and the turns ratio is 1:0.66 primary (transformer pins 5 and 6) to +5.25V isolated secondary (transformer pins 8 and 9).

Input Specifications

The primary source of power for the CO₂ power supply is the Propaq's lead acid battery. Connection is made through the Propaq's expansion connector, P1 pins 1 and 2. Supply operates on a battery voltage range from 7.0 to 10.0 V.

The battery current consumption (current through F1 from Vbat+) of the CO₂ board with SpO₂ and no CO₂ or SpO₂ probe is:

$$V_{bat+} = 8.00 \text{ V} \quad I_{ave} = 0.130 \text{ A} \quad I_{max} = 0.150 \text{ A}$$

$$V_{bat+} = 8.50 \text{ V} \quad I_{ave} = 0.140 \text{ A} \quad I_{max} = 0.160 \text{ A}$$

Vbat+ is the battery voltage measured on the CO₂ board itself, Iave is the anticipated average current for all CO₂ boards, and Imax is the maximum allowable current for any one board.

The switching power supply controller I.C. is powered by regulated non-isolated Vcc (5.0 V) from the Propaq's main board (called PP_VCC). Connection to PP_VCC is made through the expansion connector, P1 pin 10. Maximum allowable current from PP_VCC is 50 mA.

The switching power supply can be turned on or off by the Propaq DCP processor via the PP_AUXRST/ signal (P1 pin 11). When PP_AUXRST/ is high (5.0 V), the supply is enabled (except when shut off by the over voltage detection circuit); when PP_AUXRST/ is low (0.0 V), the supply is always shut off.

Output Specifications

All specifications listed below apply at 25° Celsius.

"Control Limits" refers to the range of voltages all units should typically meet. Any unit that falls outside of this range still meets specification provided it meets the minimum and maximum voltage given. The "Control Limits" is calculated by averaging the typical voltage separately with both the minimum and maximum voltages.

VBAT_SWT Supply

Voltage Range: 6.000 V to 10.00 V as VBAT+ varies from 7.000 V to 10.00 V. When the load on VBAT_SWT is 10 mA or less, then its voltage will vary from 6.865 V to 10.00 V as VBAT+ varies from 7.000 V to 10.00 V with a 0.135 V maximum difference between itself and VBAT+.

Current Rating: 75 mA

Noise Specification: 50 mV peak to peak maximum

Non-Regulated Switching Supplies

"100 kHz Ripple Voltage Specification" is noise on the supply that is synchronized with the switching controller regulator. Changes in supply voltage due to load changes (on that supply or other supplies) may exceed this specification but must be synchronized with the load changes.

Supply	Nominal Voltage	Range	Rated Current (mA)	100 kHz Ripple mV PP
-7 V (NON ISO)	-6.75*	-6.50 to -7.00*	-1	30
+17 V (ISO)	16.5*	16.0 to 17.0	40	120**
+7 V (ISO)	8.80*	8.20 to 9.4	700	165**
+7 V (ISO)***	7.75	7.25 to 8.25	700	165**
-7 V (ISO)	-7.00*	-6.80 to -7.2*	-180	10
-17 V (ISO)	-17.0*	-16.5 to -17.5*	-10	70
-50 V (ISO)	-50.0	-48.0 to -54.0	-0.250	100

*SpO₂ board plugged in, no CO₂ and no SpO₂ sensors plugged in.-7V NON-ISOLATED SUPPLY

**Any load condition.

***CO₂ sensor plugged in and operating in an ambient temperature of 25° Celsius.

Linearly Regulated Supplies

The current rating of the +5.25V isolated regulated supply includes the loads of the Vcc and +Vref supplies (they are not additional loads). When the +5.25V supply is at maximum load, its voltage will drop about 50 mV below the range given below.

Load Change Response Specification: 50 Ω load added or removed at 100 Hz, transient response is less than 50 mV peak to peak (at the time load is just added or just removed). Conditions include SpO₂ board present with both SpO₂ and CO₂ sensors plugged in.

Supply	Maximum	Typical	Minimum	Control Limit	Rated Current mA	Noise Spec mV PP
+15 V (ISO REG)	15.34	14.88	14.43	14.66 to 15.11	20	10
+5.25 V (ISO REG)	5.296	5.250	5.205	5.228 to 5.273	440	15
VREF (ISO REG)	5.042	5.000	4.979	4.979 to 5.021	357*	15
VCC (ISO REG)	5.046	5.000	4.955	4.978 to 5.023	357*	20
-6 V (ISO REG)	-6.217	-6.050	-5.888	-5.969 to -6.134	-10	10**
-15 V (ISO REG)	-15.45	-15.03	-14.62	-14.83 to -15.24	-8.8	10
-41 V (ISO REG)	-43.46	-41.72	-39.83	-40.78 to -42.59	-0.200	25***

*Current Rating: 357 mA (sum of VREF and VCC loads not to exceed 357 mA)

**Noise Specification: 10 mV peak to peak maximum (no SpO₂ probe plugged in).

***Noise Specification: 25 mV peak to peak maximum at 100 kHz.

Run Time Power Supply Integrity

During normal operation, a number of voltages are read by either A/D converter to continually validate operational integrity of the CO₂ subsystem. All of these voltage signals are checked every second. If any voltage signal is outside of its allowable (inclusive endpoint) range, for three successive readings, then a fatal error message results. All voltages read using the 552 on board A/D converter require only the highest 8 bits of each 10 bit conversion. All voltages are derived from the REF2.5V reference, except the +15V supply which is generated from the LP2951 reference.

Circuit Protection and Isolation:

With the exception of the card cage connections, connection to the battery is made through a fuse. The fuse is a 3.0 Amp., 125 V, Littlefuse Pico II Very Fast-Acting Type.

When the +5.25V isolated supply exceeds 5.918 ± 0.266 V or the +17V isolated supply exceeds 26.50 ± 1.20 V, a shutdown signal is sent through one of the speaker's optocouplers (U3B). The shutdown state is stored in a flip flop on the non-isolated side and cleared when AUXRST/ goes low.

On power up, if isolated Vcc does not exceed 4.700 V maximum or if later it falls below 4.450 ± 0.155 V, the CO₂ microcontroller is placed in reset.

Initial Power Supply Check

The 552 A/D converter converts seven signals, five of which are used to verify some aspect of hardware integrity during power up. The remaining two signals provide a way to check for the presence of the Pryon sensor and to monitor the heater voltage.

All conversion timing for measurement of CO₂ gas is timed with respect to the position of the bench rotor. The bench rotor position feedback circuitry is derived from the SENSE signal. As the rotor spins, each rotor magnet induces a bipolar voltage signal in the SENSE coil. This signal is amplified and translated to a digital level, MAG_SENSE. All A/D conversions are done with respect to this interrupt.

Four signals are observed, ADC2 through ADC5 which verify the integrity of the power supplies. These signals are tested during the power up procedure, and later, intermittently during normal operation.

+5.25_REP is also observed for proper value at power up and intermittently during normal operation to ensure power supply integrity.

Power Up Checks

During power up, a number of hardware features are checked to validate the integrity of the hardware system before CO₂ measurements are taken.

Power supplies are measured by the 552 A/D converter. See the power supply schematic. ADC2 through ADC5 measure weighted midpoints of a number of voltages. Any of these signals outside of $2.5 \text{ V} \pm 0.4 \text{ V}$ are considered out of tolerance and are reported on an Equipment Alarm screen.

The gain and offset of the AD7880 converter are measured by using the PWM_VSIG_GAIN signal. During the power up phase, each of the possible 255 PWM outputs are commanded. After each new level has settled, the AD7880 measures the analog voltage of PWM_VSIG_GAIN. All bits (more than half of the range) are tested; however, the full range of the A/D is not tested.

When no CO₂ sensor is present, VSIG:= 3(BIAS_TEST). This can be used to test the upper bits of the A/D converter.

Bill of Materials—Capnograph

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
	030-0024-00	PCB,BARE,CO2
	800-0032-00	SCHEMATIC,CO2 PCB
	824-0223-00	ASSY DWG,CO2,PCB
B1	620-0202-00	SPACER,.25 OD,4-40THD X .25 LONG,NYLON
C1	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C2	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C3	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C4	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C5	260-0005-00	CAPACITOR, CERAMIC, 1MFD, 50V, +/-10%
C6	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C7	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C8	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C9	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C10	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C11	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C12	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C13	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C14	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C15	250-0022-00	CAP,56UF,16V,+/-20%,ALUMINUM ELECTROLYTIC
C16	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C17	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C18	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C19	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C20	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C21	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C22	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C23	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C24	250-0025-00	CAP,1000UF,+/-20%,16V,ALUMINUM ELECTROLYTIC
C25	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C26	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C27	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C28	250-0027-00	CAP,100UF,63V,+/-20%,ALUMINUM ELECTROLYTIC
C29	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C30	250-0025-00	CAP,1000UF,+/-20%,16V,ALUMINUM ELECTROLYTIC
C31	250-0025-00	CAP,1000UF,+/-20%,16V,ALUMINUM ELECTROLYTIC
C32	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C33	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C34	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C35	250-0026-00	CAP,330UF,+/-20%,16V,8MMX11.5MM,ALUMINUM ELEC
C36	250-0026-00	CAP,330UF,+/-20%,16V,8MMX11.5MM,ALUMINUM ELEC

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
C37	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C38	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C39	250-0025-00	CAP,1000UF,+/-20%,16V,ALUMINUM ELECTROLYTIC
C40	250-0026-00	CAP,330UF,+/-20%,16V,8MMX11.5MM,ALUMINUM ELEC
C41	250-0017-00	CAP,ELECTROLYTIC,82UF,25V,105DEG C,+/-20%
C42	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C43	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C44	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C45	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C46	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C47	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C48	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C49	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C50	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C51	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C52	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C53	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C54	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C55	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C56	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C57	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C58	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C59	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C60	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C61	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C62	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C63	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C64	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C65	261-0021-00	CAP,SMD,CER,22PF,+/-10%,50V,NPO,1206
C66	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C67	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C68	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C69	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C70	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C71	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C72	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C73	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C74	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C75	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C76	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C77	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C78	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
C79	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C80	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C81	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C83	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C84	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C85	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C86	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C87	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C88	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C89	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C90	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C91	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C92	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C93	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C94	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C95	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C96	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C97	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C98	261-0023-00	CAP,SMD,CER,4700PF,5%,50V,X7R,1206
C99	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C100	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C101	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C102	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C103	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C104	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C105	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C106	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C107	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C108	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C109	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C110	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C111	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C112	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C113	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C114	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C115	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C116	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C117	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C118	261-0018-00	CAP,SMD,CER,390PF,+/-10%,50V,NPO,1206
C119	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C120	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C121	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
C122	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C123	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C124	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C125	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C126	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C127	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C128	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C129	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C130	261-0004-00	CAPACITOR, SURFACE MOUNT, CERAMIC, .047 UF 5%, 50V X7R
C131	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C132	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C133	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C134	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C135	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C136	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C137	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C138	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C139	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C140	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C141	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C142	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C143	261-0011-00	CAP,SMD,CER,47PF,1%,50V,NPO,1
C144	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C145	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C146	261-0033-00	CAP,SMD,CER,0.022UF,5%,100V,X7R,1206
C147	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C148	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C149	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C150	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C151	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C152	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C153	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C154	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C155	261-0006-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 1000 PF, 5%, 50V NPO
C156	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C157	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C158	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C159	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C160	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C161	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C201	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C202	261-0011-00	CAP,SMD,CER,47PF,1%,50V,NPO,1

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
C203	261-0002-00	CAPACITOR, SURFACE MOUNT, CERAMIC, 220PF 1% 100V NPO
C204	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C205	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C206	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C207	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C208	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C209	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C210	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C211	261-0010-00	CAPACITOR, SMT, 100PF, 1%, NPO, 1206 PKG
C212	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
C213	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C214	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C215	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C216	261-0001-00	CAPACITOR, SURFACE MOUNT CERAMIC, 0.1UF 10% 50 V, X7R
C217	261-0012-00	CAP,SMD,CERAMIC,.01UF,+/-5
D1	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D2	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D3	307-0019-00	DIODE,SCHOTTY,SMD,1A,30V,MBRS130T3
D4	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D5	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D6	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D7	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D8	308-0016-10	DIODE,ZENER,22V,5%,SOT-23
D9	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D10	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D11	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D12	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D13	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D14	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D15	306-0006-10	DIODE,MBAV74L,SWITCHING,COMMON CATHODE,50V
D16	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D17	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D18	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D19	307-0020-00	DIODE,SCHOTTKY,SMD,1A,40V,MBRS 140T3
D20	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D21	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D22	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D23	308-0019-10	DIODE,ZENER,18V,5%,SOT-23
D24	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D25	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D26	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D27	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
D28	308-0011-10	DIODE,ZENER,12V,5%,SOT-23
D29	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D30	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D31	307-0019-00	DIODE,SCHOTTY,SMD,1A,30V,MBRS130T3
D32	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D33	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D34	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D35	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D36	308-0020-10	DIODE,ZENER,5.6V,5%,SOT-23
D37	307-0020-00	DIODE,SCHOTTKY,SMD,1A,40V,MBRS 140T3
D38	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D39	307-0019-00	DIODE,SCHOTTY,SMD,1A,30V,MBRS130T3
D40	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D41	307-0020-00	DIODE,SCHOTTKY,SMD,1A,40V,MBRS 140T3
D42	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D43	306-0002-08	DIODE, SWITCHING, 85V, 250MA, LL34 PKG
D44	308-0016-10	DIODE,ZENER,22V,5%,SOT-23
D45	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D46	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D48	308-0016-10	DIODE,ZENER,22V,5%,SOT-23
D49	306-0005-10	DIODE,MMBD6050X,SWITCHING,70V
D50	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D51	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D52	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
D53	306-0001-10	DIODE ARRAY, GENERAL PURPOSE,MBAV99,SOT-23 PACKAGE
F1	503-0008-00	FUSE, PICO, 3A, 125V
HS1	600-0069-00	HEAT SINKS, .375"(9.53) BLACK ANODIZED WITH TABS
L1	350-0005-00	INDUCTOR,15 UH
L2	350-0005-00	INDUCTOR,15 UH
L3	350-0019-00	INDUCTOR,47UH
L4	350-0018-00	INDUCTOR,TORROID,100uH
L5	351-1040-01	INDUCTOR, 10UH, SURFACE MOUNT
N1	620-0024-00	NUT,HEX,6-32,SS
N2	620-0145-00	SCREW,4-40,PH,PH,SS,.25 LG
P1	610-0086-00	HEADER,12 PIN,DUAL ROW,ST.PIN W/LOCKING CLIPS
P2	610-0049-00	HEADER,2PIN,.100 CTR
P4	610-0055-00	HEADER,5-PIN
P5	610-0159-00	CONN,MALE,TERMINAL STRIP (DUAL ROW)
P6	610-0193-00	SOCKET STRIP,8X2,0.1INCH
P7	610-0193-00	SOCKET STRIP,8X2,0.1INCH
P8	610-0069-00	HEADER,14 PIN
Q1	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
Q2	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q3	302-0012-03	XSTR,DUAL MOSFET,N-CHANNEL,SI9956,SOIC
Q4	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE
Q5	301-0011-10	XSTR,MMBTA92L,PNP,HIGH VOLTAGE
Q6	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q7	301-0011-10	XSTR,MMBTA92L,PNP,HIGH VOLTAGE
Q9	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q10	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q11	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q12	302-0011-00	XSTR,PN4118,N-CHANNEL,JFET,LOW LEAKAGE
Q13	301-0011-10	XSTR,MMBTA92L,PNP,HIGH VOLTAGE
Q14	301-0013-10	XSTR,PNP HIGH BETA,BC807-40L,SOT-23
Q15	301-0003-10	TRANSISTOR,PNP DARLINGTON,MMBTA63,SOT23 PK
Q16	301-0002-10	TRANSISTOR,PNP SMALL SIGNAL,MMBT3906 ,SOT23 PACKAGE
Q17	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q18	301-0007-10	XSTR,2N7002,TMOSFET,N-CHANNEL
Q19	301-0013-10	XSTR,PNP HIGH BETA,BC807-40L,SOT-23
Q20	302-0012-03	XSTR,DUAL MOSFET,N-CHANNEL,SI9956,SOIC
Q21	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
Q22	301-0001-10	TRANSISTOR,NPN,SMALL SIGNAL,MMBT3904,SOT23
R1	201-8252-00	RESISTOR,SURFACE MOUNT, 1206, 82.5K, 1%
R2	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R3	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R4	201-6812-00	RES.SMD.68.1K,1%,0.125W,1206,100PPM/DEG C
R5	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R6	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R7	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R8	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R9	201-4993-00	RES,SMD,499K,1%,.125W,1206
R10	201-4320-00	RES,SMD,432 OHM,1%,0.125W,1206,100 PPM/DEG C
R11	205-0019-00	RESISTOR,24.0K OHM,.02%,.1W
R12	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R13	205-0021-00	RESISTOR,75.0K OHM,.02%,.1W
R14	202-1501-00	RES,1500OHM,1206,0.1%,25PPM T.C.
R15	202-0001-00	RESISTOR,100K OHM,0.1%
R16	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R17	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R18	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R19	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R20	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R21	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R22	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

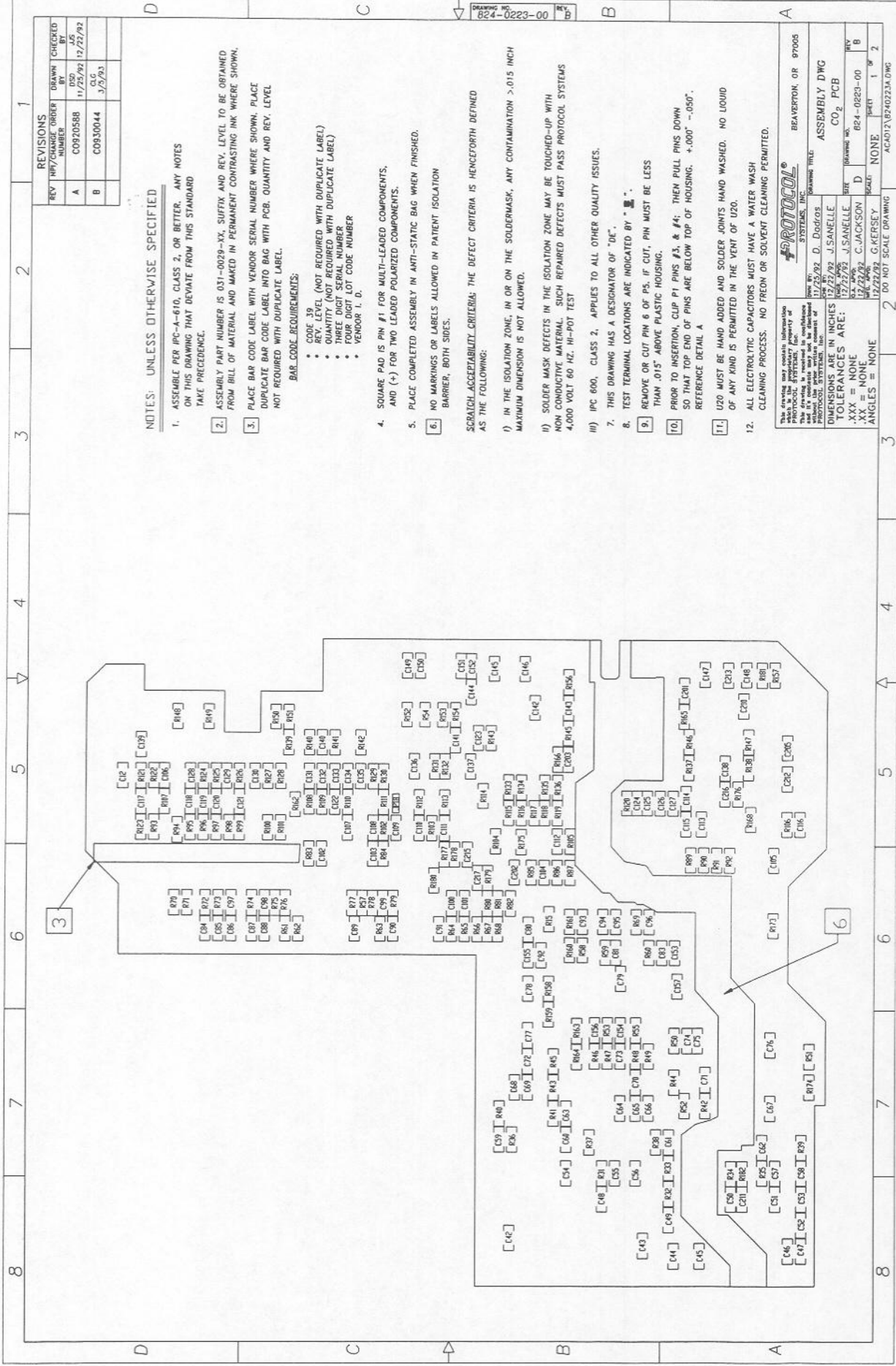
DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
R23	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R24	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R25	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R26	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R27	205-0023-00	RESISTOR,59.0K OHM,.02%,.1W
R28	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R29	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R31	201-4753-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 475K 1%
R32	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R33	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R34	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R35	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R36	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R37	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R38	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R39	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R40	201-3741-00	RES,SMD,3.74K,1%,0.125W,1206,100 PPM/DEG C
R41	201-4993-00	RES,SMD,499K,1%,.125W,1206
R42	201-2551-00	RES,SMD,2.55K,1%,0.125W,1206,+/-100PPM/DEG C
R43	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R44	201-4320-00	RES,SMD,432 OHM,1%,0.125W,1206,100 PPM/DEG C
R45	201-1000-00	RES,SMD,100 OHM,1206,1%
R46	201-1000-00	RES,SMD,100 OHM,1206,1%
R47	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R48	201-8453-00	RES,SMD,845K,1%,.125W,1206,TC 100PPM/C
R49	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R50	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R51	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R52	201-1000-00	RES,SMD,100 OHM,1206,1%
R53	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R54	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R55	201-0000-00	RES,SMD,0 OHM,1206
R57	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R58	201-7503-00	RES,SMD,750K,1%,.125W,1206
R59	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R60	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R61	201-1000-00	RES,SMD,100 OHM,1206,1%
R62	201-1000-00	RES,SMD,100 OHM,1206,1%
R63	201-1000-00	RES,SMD,100 OHM,1206,1%
R64	201-1503-00	RES,SMD,150K OHM,1%,0.125W,1206,100PPM/DEG C
R65	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%
R66	201-3322-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 33.2K 1%

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
R67	201-4992-00	RES,SMD,49.9K,1%
R68	201-4993-00	RES,SMD,499K,1%,.125W,1206
R69	201-1000-00	RES,SMD,100 OHM,1206,1%
R70	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R71	201-2213-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 221K +/-1%
R72	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R73	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R74	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R75	209-1003-00	RES,SMD,1206,100K,0.5%,25PPM/DEG C
R76	209-1003-00	RES,SMD,1206,100K,0.5%,25PPM/DEG C
R77	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R78	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R79	201-1213-00	RES,SMD,121K,1%,0.125W,1206
R80	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R81	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R82	201-4993-00	RES,SMD,499K,1%,.125W,1206
R83	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R84	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R85	209-1003-00	RES,SMD,1206,100K,0.5%,25PPM/DEG C
R86	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R87	209-1003-00	RES,SMD,1206,100K,0.5%,25PPM/DEG C
R89	201-2002-00	RES,SMD,20.0K,1%,1206,+/-100 PPM/DEGREE C
R90	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R91	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R92	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R93	201-2491-00	RES,2.49K,+/- 1%,1206 PKG.,100PPM TEMP.COEFF.
R94	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R95	201-2491-00	RES,2.49K,+/- 1%,1206 PKG.,100PPM TEMP.COEFF.
R96	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R97	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R98	201-2214-00	RES,SMD,2.20M,5%,+/- 200 PPM
R99	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R100	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R101	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R102	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R103	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R104	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R105	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R106	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R107	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R108	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R109	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
R110	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R111	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R112	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R113	201-2211-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 2.21K +/-1%
R114	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R115	209-1003-00	RES,SMD,1206,100K,0.5%,25PPM/DEG C
R116	201-9763-00	RES,SMD,976K,1%,1206,100 PPM/DEG C
R117	201-6813-00	RES,681K OHMSMD,1206,100PPM/C
R118	201-1501-00	RESISTOR,SMD,1.50K,1%,.125,1206
R119	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R120	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R121	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R122	201-1000-00	RES,SMD,100 OHM,1206,1%
R123	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R124	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R125	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R126	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R127	201-5903-00	RES,SMD,590K,1%,.125W,1206,100PPM/DEG C
R128	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R129	201-6813-00	RES,681K OHMSMD,1206,100PPM/C
R130	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R131	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R132	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R133	201-1333-00	RES,SMD,133K,1%,.125W,1206,100PPM/DEG C
R134	201-2214-00	RES,SMD,2.20M,5%,+/- 200 PPM
R135	201-3013-00	RES,SMD,301K,1%,0.125W,+/-100PPM/C,1206
R136	201-1004-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1.0 MEG +/-1%
R137	201-1000-00	RES,SMD,100 OHM,1206,1%
R138	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R139	201-4752-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 47.5K 1%
R140	209-1002-00	RES,SMD,1206,10.0K,.5%,+/-25PPM/DEG C
R141	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R142	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R143	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R145	201-1500-00	RES,SMD,150 OHMS,1/8W,1%
R146	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R147	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R148	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R149	201-100Z-00	RES,SMD,10 OHM,1%,0.125W,+/-250PPM,1206
R150	201-1501-00	RESISTOR,SMD,1.50K,1%,.125,1206
R151	201-1504-00	RES,SMD,1.50 M,1%,1206,200 PPM/DEG C
R152	201-3323-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 332K 1%

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
R153	201-1000-00	RES,SMD,100 OHM,1206,1%
R154	201-249Z-00	RES,SMD,24.9 OHM,1%,0.125W,+/-250PPM,1206 PKG
R156	201-5110-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 511 OHM 1%
R157	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R158	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R159	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R160	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R161	201-1002-00	RES,SMT,1206 PKG,10.0K,+/-1%
R162	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R163	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R164	201-4751-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 4.75K 1%
R165	201-499Z-00	RESISTOR,49.9 OHMS,1%,SMT
R166	201-2740-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 274 OHM 1%
R167	201-0000-00	RES,SMD,0 OHM,1206
R168	201-0000-00	RES,SMD,0 OHM,1206
R169	201-0000-00	RES,SMD,0 OHM,1206
R170	201-0000-00	RES,SMD,0 OHM,1206
R171	201-1000-00	RES,SMD,100 OHM,1206,1%
R172	201-1000-00	RES,SMD,100 OHM,1206,1%
R173	201-1000-00	RES,SMD,100 OHM,1206,1%
R174	201-1000-00	RES,SMD,100 OHM,1206,1%
R175	201-1001-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 1000 OHM 1%
R176	201-1003-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 100K, 1%
R177	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R178	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R179	201-2212-00	RESISTOR, SURFACE MOUNT, 1206 PKG, 22.1K +/-1%
R180	201-6981-00	RES,SMD,6.98K,1%,0.125W,1206,+/-100PPM/DEG C
R181	201-1000-00	RES,SMD,100 OHM,1206,1%
R182	201-1000-00	RES,SMD,100 OHM,1206,1%
RP1	225-0006-00	RES,100K OHM,13 TURN,SURFACE MOUNT,TRIM POT
RP2	228-0007-00	RES,VAR,SMD,20K,+/-20%,SEALED
S1	620-0003-00	SCREW,6-32X.25"LONG,PH,SS,PHILLIPS
T1	360-0009-00	TRANSFORMER,CO2 & SPO2
TP17	503-0022-00	TEST TERMINAL
TP21	503-0022-00	TEST TERMINAL
TP35	503-0022-00	TEST TERMINAL
U1	610-0006-00	SOCKET, 32 PIN PLCC THRU-HOLE
U2	441-0004-02	UART,SCC2691
U3	322-0001-00	PS-2501-2,OPTOCOUPLER,MULTICHANNEL
U4	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
U5	400-0014-03	IC,INVERTER,HEX,,SCHMITT-TRIGGER,74HC14
U6	400-0573-03	OCTAL "D" LATCH

DE Drawing Designator (Dwg. #824-0223-00), CO2 Board 031-0029-00		
Reference Designator	Part Number	Description
U7	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U8	470-0012-03	IC,SMD,AUDIO AMPLIFIER,MC34119
U9	430-0005-03	IC,SMD,256K BIT SRAM,LOW STANDBY CURRENT
U10	400-0000-03	IC, SMT, 74HC00, QUAD 2-INPUT POSITIVE NAND GATE, S014 PKG
U11	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U12	400-0123-03	IC, SMT, 74HC123A, DUAL TRIGGERABLE MONOSTABLE MULTIVIB, SOIC16
U13	322-0010-00	PHOTOCOUPLER,HCPL-2611,HIGH SPEED
U14	482-4052-03	IC, SMT, 4052 ANALOG MULTIPLEXER/DEMULTI, SOIC
U15	440-8055-00	IC,MICROCONTROLLER,8-BIT
U16	322-0010-00	PHOTOCOUPLER,HCPL-2611,HIGH SPEED
U17	400-0173-03	IC,SOIC 16,QUAD D F-F,TRI-STATE
U18	470-0017-00	IC,SMD,OP AMP,LT1097,PRECISION,LOW POWER
U19	470-0018-03	IC,SMD,TLC27M2,PRECISION DUAL OPER. AMPLIFIR
U20	503-0048-00	ICS 1220A 15PSI ABSOLUTE PRESSURE TRANSDUCER
U21	472-0001-03	IC, SMT, VOLTAGE REG,LP2951,ADJUSTABLE MICROPOWER
U22	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
U23	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
U24	481-0005-00	IC,A/D,12 BIT,PARALLEL,AD7880
U25	470-0020-03	IC,SMD,OP AMP,TLC27M7I,LOW OFFSET
U26	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U27	470-0018-03	IC,SMD,TLC27M2,PRECISION DUAL OPER. AMPLIFIR
U28	473-0004-03	IC,LT1009,2.5V,PRECISION REFERENCE DIODE,SOIC
U29	470-0019-00	IC,SMD,OP-AMP,TLC271,PROG.PWR/LOW OFFSET
U30	470-0011-03	IC,SMD,OP-AMP,TL032,LOW POWER/LOW OFFSET
U31	470-0018-03	IC,SMD,TLC27M2,PRECISION DUAL OPER. AMPLIFIR
U32	482-4051-03	4051 ANALOG MULTIPLEXER, SINGLE 8 CHANNEL
U33	322-0003-00	PHOTOCOUPLER,NEC PS2501-1
U34	474-0007-04	IC,LT1170CT,SWITCHING REGULATOR,100KHZ
U35	470-0018-03	IC,SMD,TLC27M2,PRECISION DUAL OPER. AMPLIFIR
U36	470-0017-00	IC,SMD,OP AMP,LT1097,PRECISION,LOW POWER
U37	475-0006-03	IC,4420,MOSFET DRIVER,SOIC
U38	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U39	400-0008-03	IC,SMT,,QUAD 2 INPUT AND GATE,74HC08
U110	472-0010-00	VOLTAGE DETECTOR,4.45V,+/-3.5%,SOT-89
U111	472-0010-00	VOLTAGE DETECTOR,4.45V,+/-3.5%,SOT-89
U112	400-0132-03	IC,SMD,74HC132,QUAD SCHMITT TRIGGER NAND
Y1	502-0014-00	CRYSTAL,3.6864 MHZ,PARALLEL MODE,HC49M
Y2	502-0013-00	CRYSTAL,10.752 MHZ,PARALLEL MODE,MC49M



NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLE PER IPC-A-610, CLASS 2, OR BETTER. ANY NOTES ON THIS DRAWING THAT DEVIATE FROM THIS STANDARD TAKE PRECEDENCE.
2. ASSEMBLY PART NUMBER IS 031-0029-XX, SUFFIX AND REV. LEVEL TO BE OBTAINED FROM BILL OF MATERIAL AND MAXED IN PERMANENT CONTRASTING INK WHERE SHOWN.
3. PLACE BAR CODE LABEL WITH VENDOR SERIAL NUMBER WHERE SHOWN. PLACE DUPLICATE BAR CODE LABEL INTO BAG WITH PCB. QUANTITY AND REV. LEVEL NOT REQUIRED WITH DUPLICATE LABEL.

BAR CODE REQUIREMENTS:

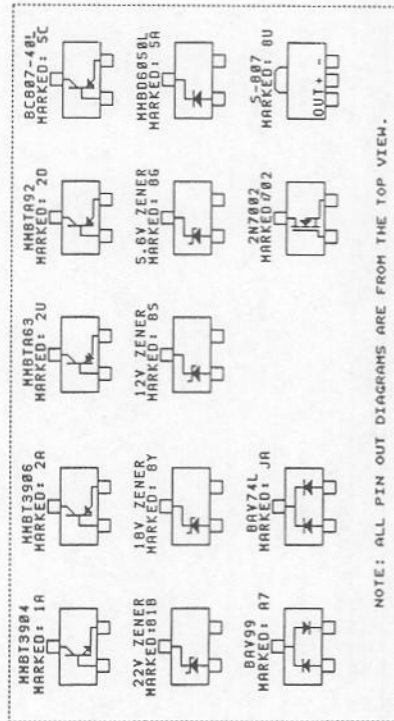
- CODE 39
- REV. LEVEL (NOT REQUIRED WITH DUPLICATE LABEL)
- QUANTITY (NOT REQUIRED WITH DUPLICATE LABEL)
- THREE DIGIT SERIAL NUMBER
- FOUR DIGIT LOT CODE NUMBER
- VENDOR I. D.

4. SQUARE PAD IS PIN #1 FOR MULTI-LEADED COMPONENTS, AND (+) FOR TWO LEADED POLARIZED COMPONENTS.
5. PLACE COMPLETED ASSEMBLY IN ANTI-STATIC BAG WHEN FINISHED.
6. NO MARKINGS OR LABELS ALLOWED IN PATENT ISOLATION BARRIER, BOTH SIDES.

SCRATCH ACCEPTABILITY CRITERIA: THE DEFECT CRITERIA IS HENCEFORTH DEFINED AS THE FOLLOWING:

- I) IN THE ISOLATION ZONE, IN OR ON THE SOLDERMASK, ANY CONTAMINATION >.015 INCH MAXIMUM DIMENSION IS NOT ALLOWED.
- II) SOLDER MASK DEFECTS IN THE ISOLATION ZONE MAY BE TOUCHED-UP WITH NON CONDUCTIVE MATERIAL. SUCH REPAIRED DEFECTS MUST PASS PROTOCOL SYSTEMS 4,000 VOLT 60 HZ. HI-POT TEST
- III) IPC 600, CLASS 2, APPLIES TO ALL OTHER QUALITY ISSUES.
7. THIS DRAWING HAS A DESIGNATOR OF "0E".
8. TEST TERMINAL LOCATIONS ARE INDICATED BY "T".
9. REMOVE OR CUT PIN 6 OF P3, IF CUT, PIN MUST BE LESS THAN .015" ABOVE PLASTIC HOUSING.
10. PRIOR TO INSERTION, CLIP P1 PINS #3, & #4; THEN PULL PINS DOWN SO THAT TOP END OF PINS ARE BELOW TOP OF HOUSING. +.000" -.050". REFERENCE DETAIL A
11. U20 MUST BE HAND ADDED AND SOLDER JOINTS HAND WASHED. NO LIQUID OF ANY KIND IS PERMITTED IN THE VENT OF U20.
12. ALL ELECTROLYTIC CAPACITORS MUST HAVE A WATER WASH CLEANING PROCESS. NO FRED OR SOLVENT CLEANING PERMITTED.

This drawing may contain information that is proprietary to the company. It is to be controlled and its use is restricted to the company. It is to be controlled and its use is restricted to the company.		BEAVERTON, OR 97005 DRAWING TITLE ASSEMBLY DWG CO. PCB	
DATE BY 11/25/92 D. Dodgson	DATE BY 12/22/92 J. SANELLE	DATE BY 12/22/92 J. SANELLE	DATE BY 12/22/92 J. SANELLE
DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XXX = NONE .XX = NONE .X = NONE	DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XXX = NONE .XX = NONE .X = NONE	DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XXX = NONE .XX = NONE .X = NONE	DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XXX = NONE .XX = NONE .X = NONE
SCALE: NONE	SCALE: NONE	SCALE: NONE	SCALE: NONE
SHEET: 1	SHEET: 1	SHEET: 1	SHEET: 1
TOTAL: 2	TOTAL: 2	TOTAL: 2	TOTAL: 2



NOTES:

1. ALL COUPLING CAPACITORS ARE CERAMIC WITH TOLERANCE OF 10% UNLESS SPECIFIED.
- 2: ALL RESISTORS TOLERANCES ARE 1 % UNLESS SPECIFIED.

2: ALL RESISTORS TOLERANCES ARE 1 % UNLESS SPECIFIED.

PROTOCOL SYSTEMS, INC.
BEAVERTON, OR.

Table

SCHEMATIC CO₂ PCB

SCHEMATIC CO2 PCB

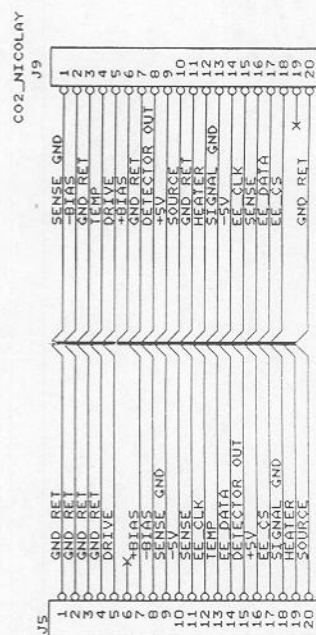
SCHEMATIC, CO2 PCB

Size	Document Number
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0	800-0032-00
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Date: January 25, 1993 Sheet 1

FILE: DRAWINGS.SHT



FOR REFERENCE ONLY

FILE: MS_SEN_O.SHT

PROTOCOL SYSTEMS, INC.

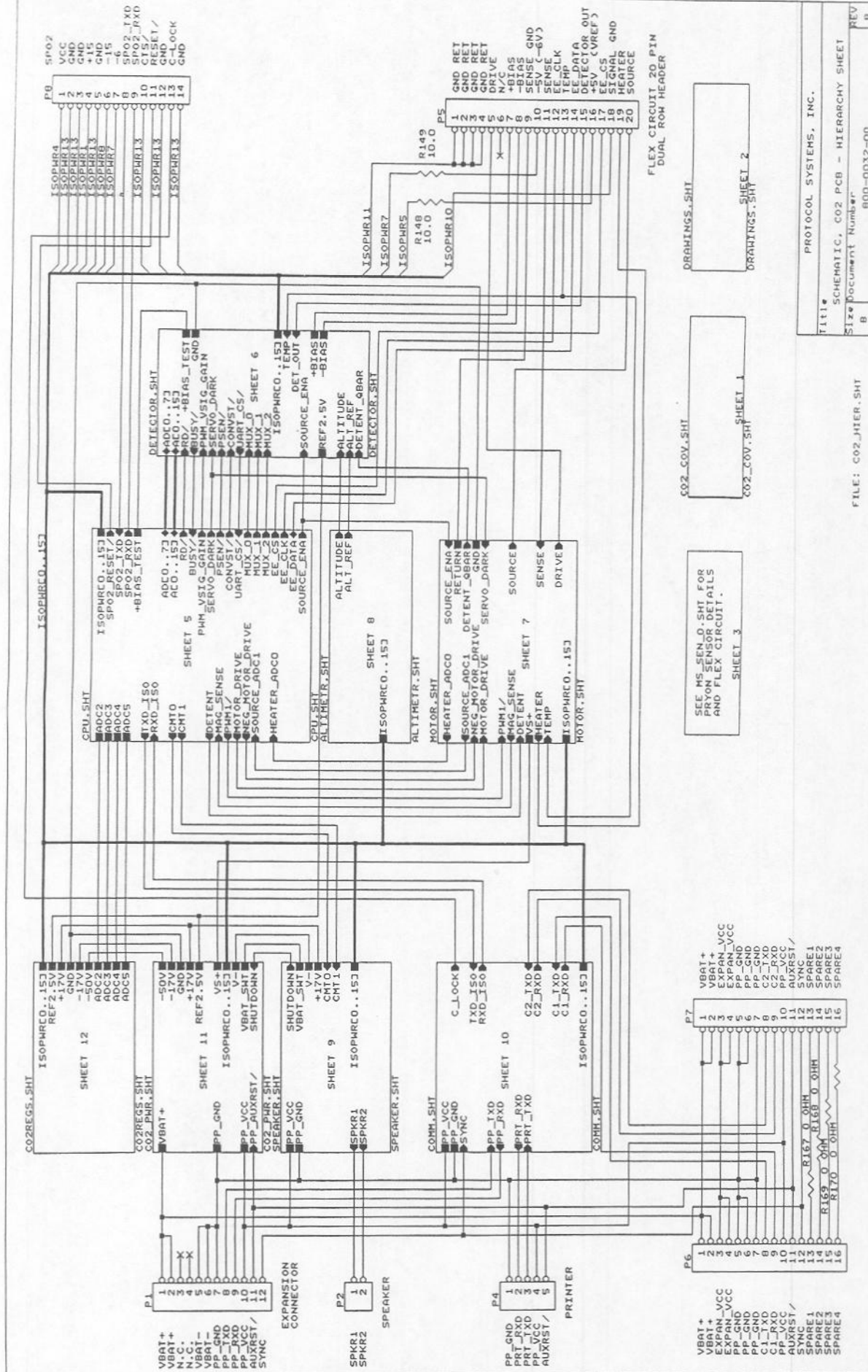
BEAVERTON, OR.

1110

File	Document Number	REV
SCHEMATIC, CO2 CABLE AND FLEX CIRCUIT		

8	800-0032-00	8
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Date: January 25, 1993 Sheet 3 of 12



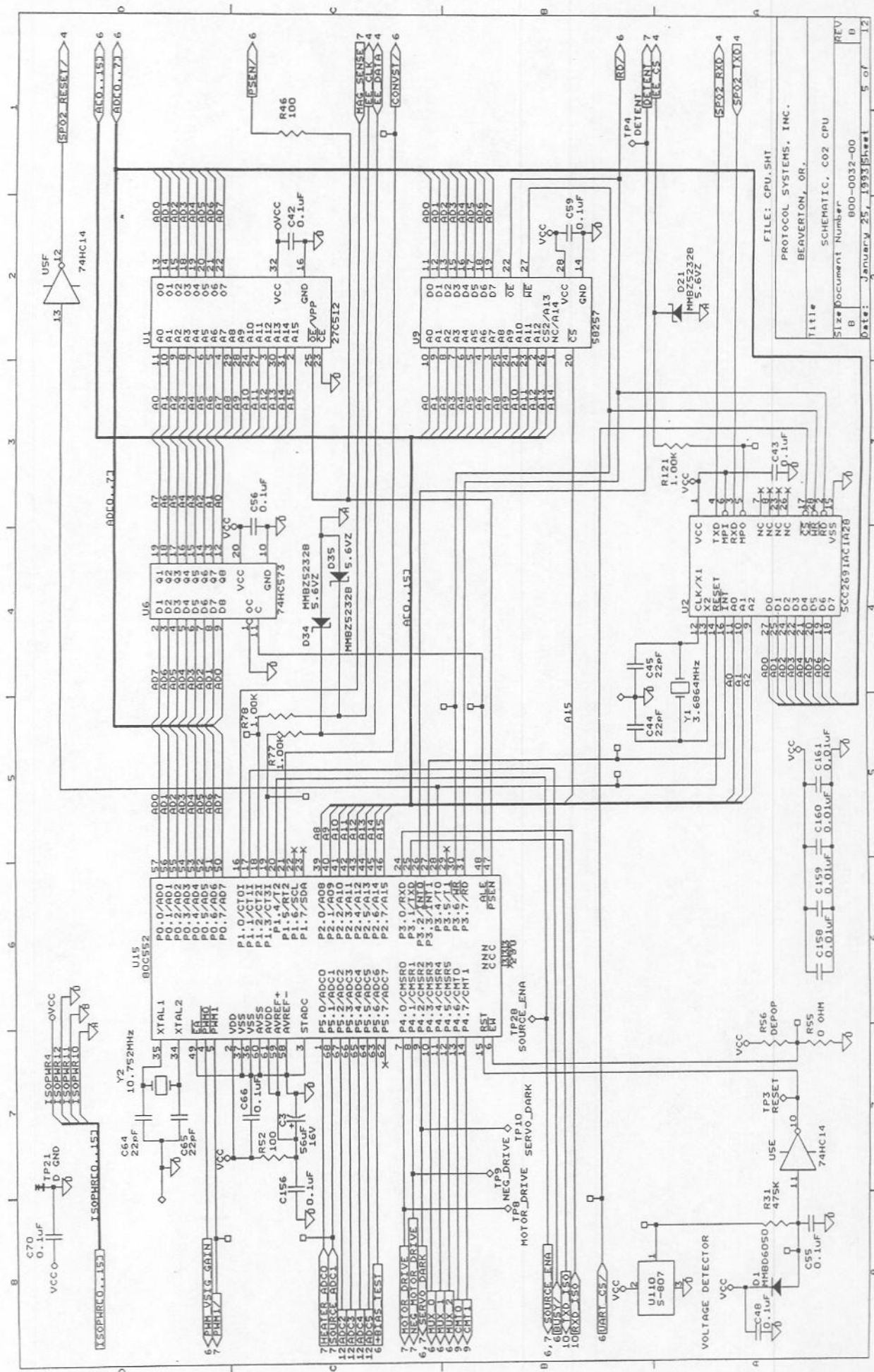
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Size	Document Number
REV	8
Date	January 25, 1993
Sheet	4 of 12

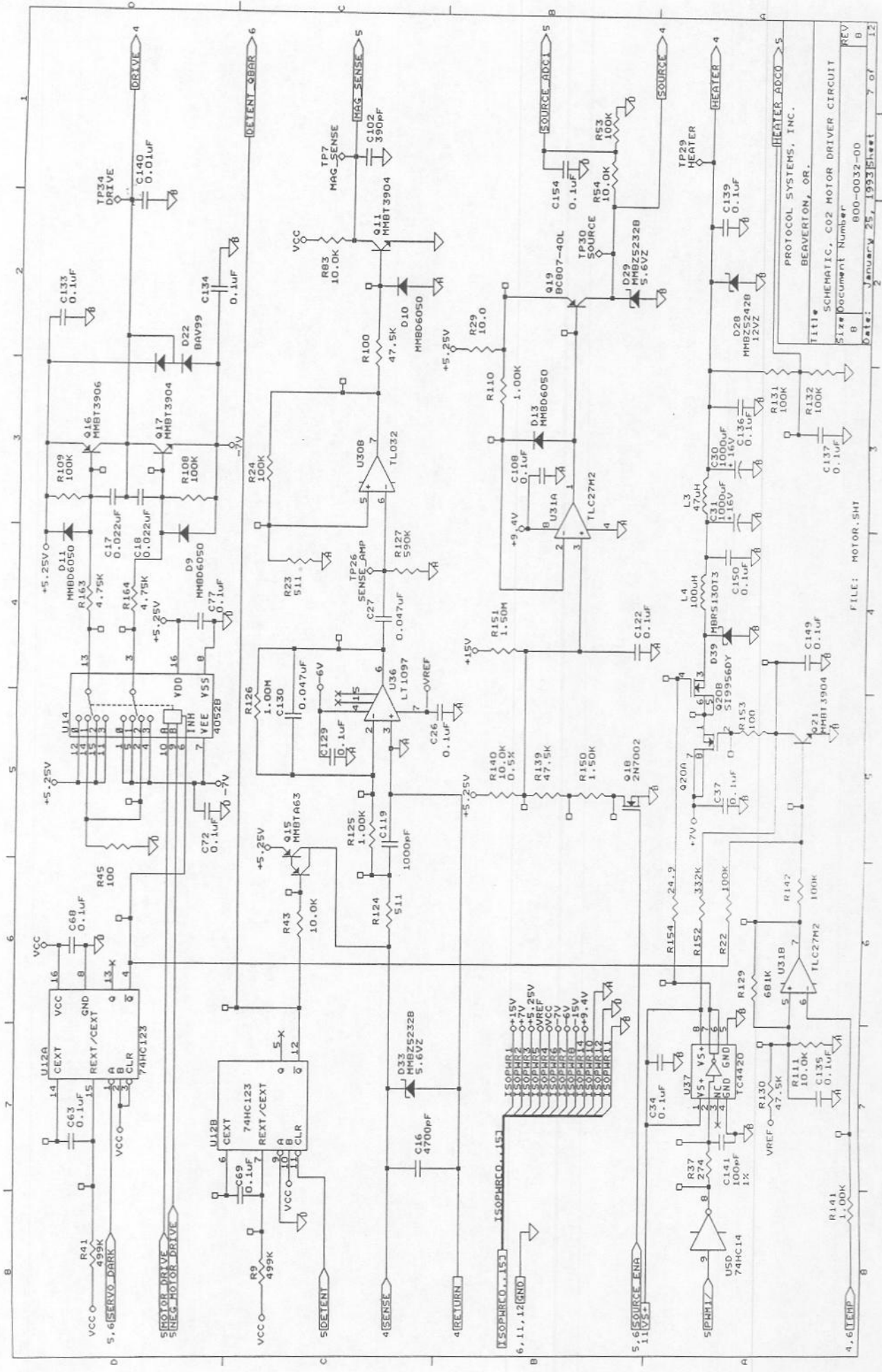
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CO2_COV.SHT
DRAWINGS.SHT

CO2_COV.SHT
DRAWINGS.SHT

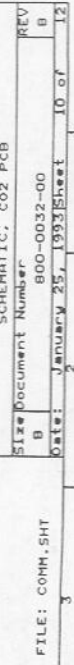
SEE MS_SEN.D.SHT FOR
PRYN SENSOR DETAILS
AND FLEX CIRCUIT.
SHEET 3

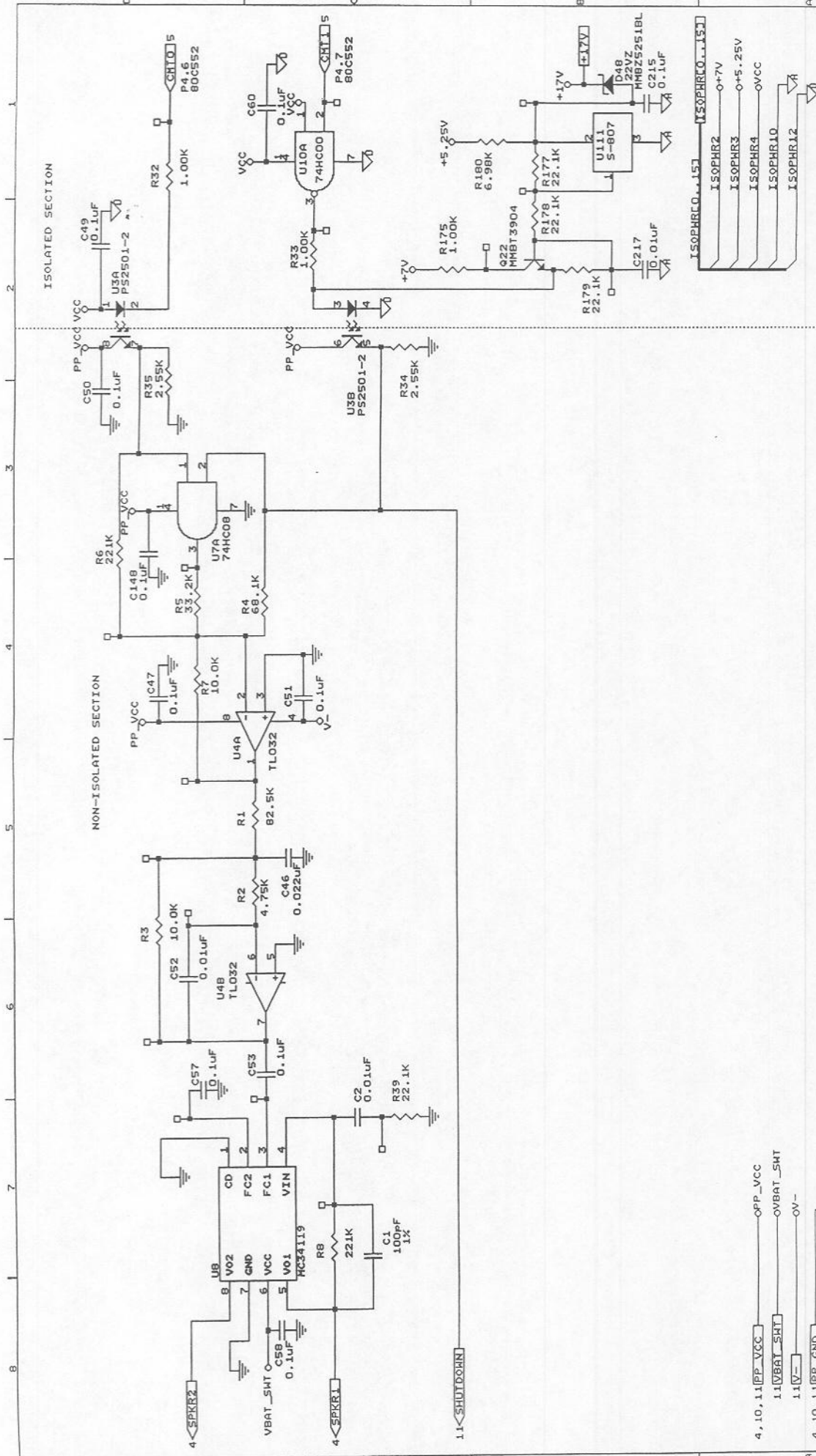




TITLE: SCHEMATIC, CO2 MOTOR DRIVER CIRCUIT
 SIZE: 8 1/2" x 11"
 DATE: JANUARY 25, 1993
 SHEET: 7 OF 12

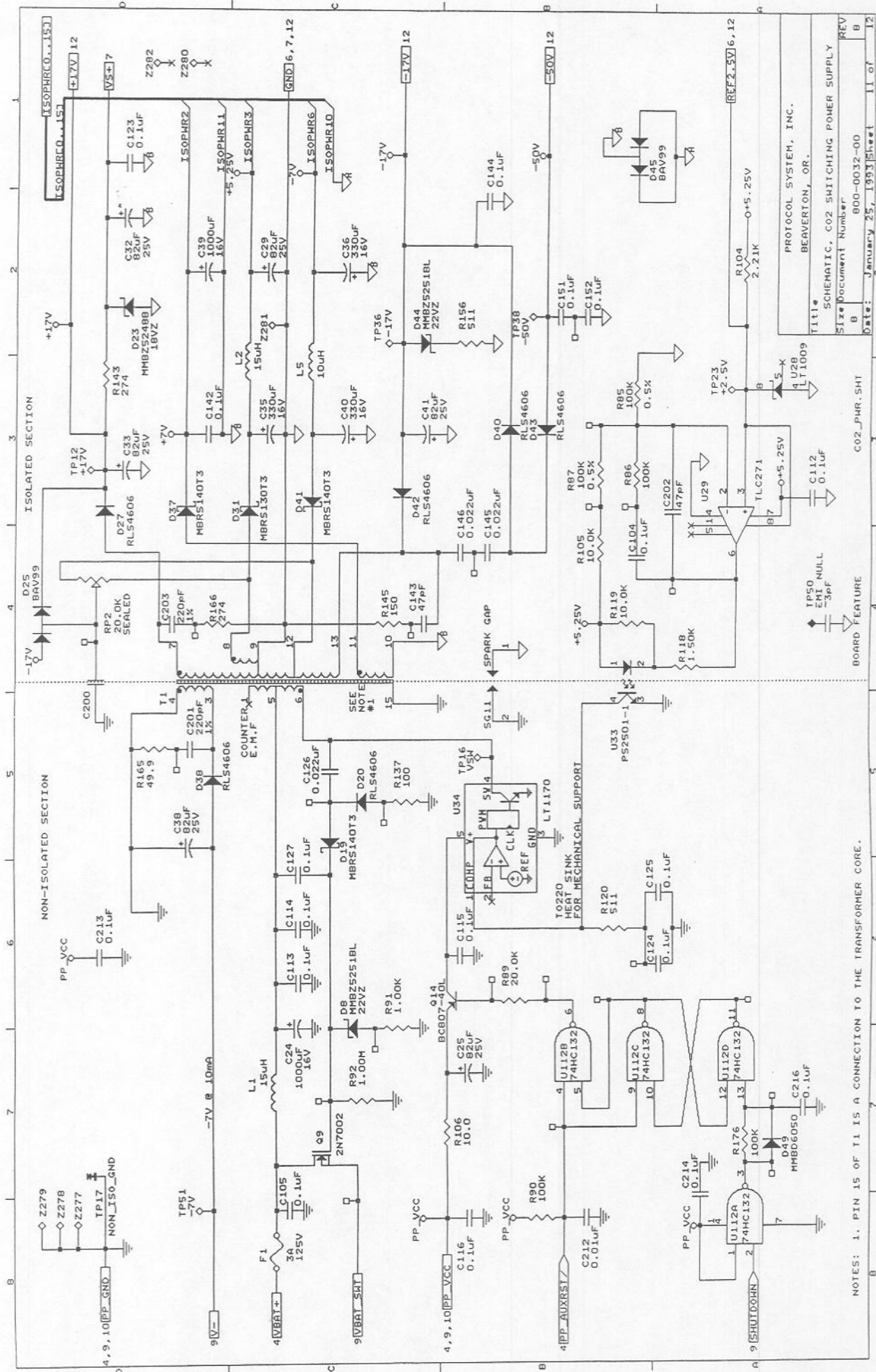
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 TITLE: SCHEMATIC, CO2 MOTOR DRIVER CIRCUIT
 SIZE: 8 1/2" x 11"
 DATE: JANUARY 25, 1993
 SHEET: 7 OF 12





Title		PROTOCOL SYSTEMS, INC.
Beaverton, OR.		
Size		SCHEMATIC, CO2 SPEAKER DRIVER
Document Number		800-0032-00
REV		B
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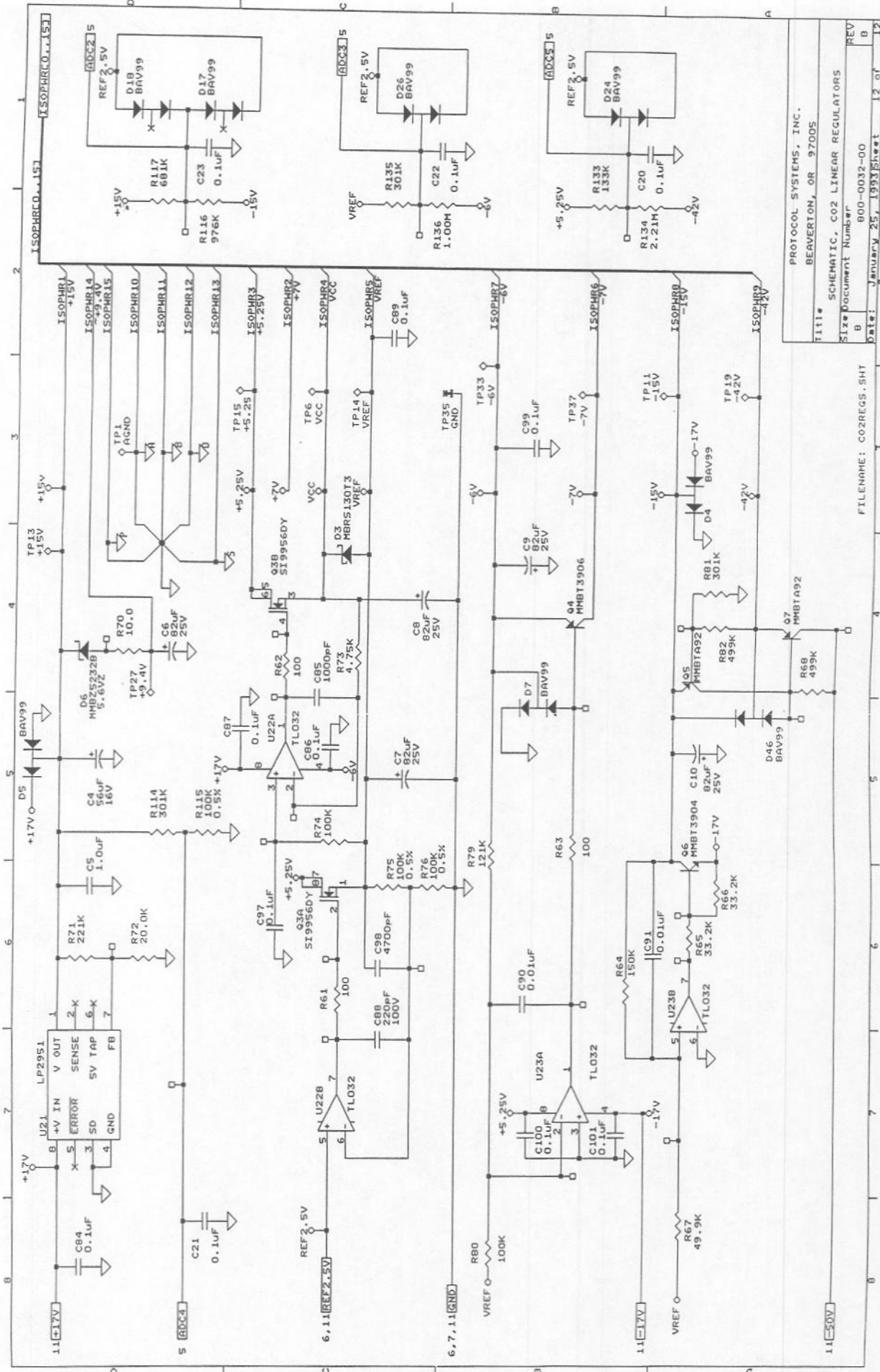
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NOTES: 1. PIN 15 OF T1 IS A CONNECTION TO THE TRANSFORMER CORE.

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